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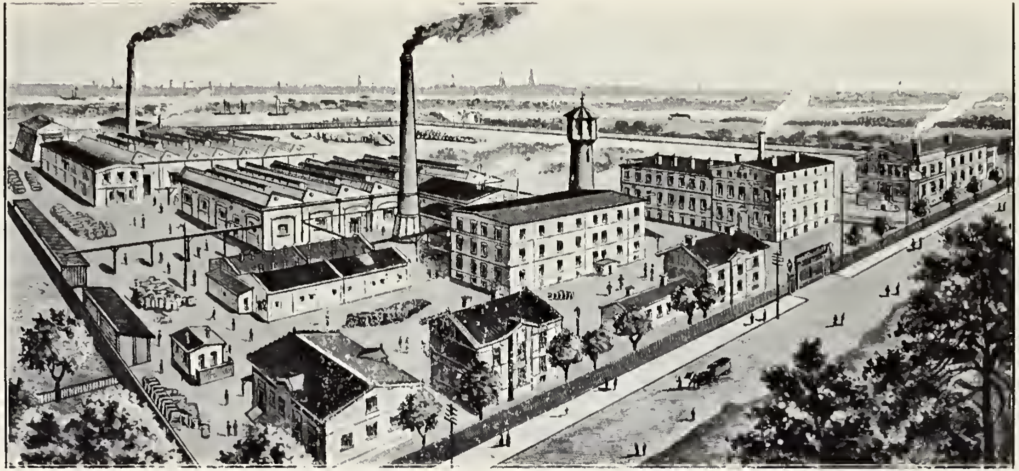
MANUFACTURE LYONNAISE DE MATIÈRES COLORANTES, LYONS.

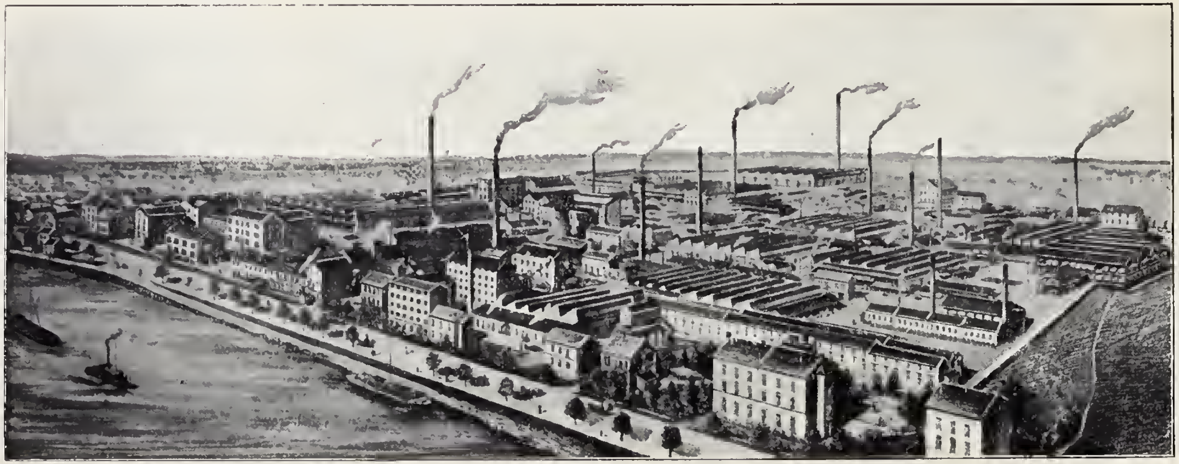
Works "La Mouche".

RUSSIAN ANILINE COLOUR WORKS LEOPOLD CASSELLA & C$^{\underline{o}}$, RIGA.



Works at Riga.

LEOPOLD CASSELLA & C$^{\underline{o}}$, G. m. b. H., FRANKFORT o. M.



Works at Mainkur near Frankfort o. M.

THE DYEING OF UNIONS

WITH THE DYESTUFFS

OF

LEOPOLD CASSELLA & Cº
G. m. b. H.

FRANKFORT o. M.

FRANKLIN INSTITUTE
PHILADELPHIA

THIRD (ENLARGED) EDITION.

PUBLISHED BY
LEOPOLD CASSELLA & Cº, G. m. b. H., FRANKFORT o. M.
1906.

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PREFACE.

Since the introduction of the one-dip process which we elaborated a number of years ago, the dyeing of union goods has developed enormously and attained a very high degree of perfection. We therefore published in 1897 already our book, "The Application of the Diamine Colours on Cotton and Wool Mixed Goods", which was followed in 1900 by a second edition. Owing to the great demand, this second edition has now been for some time out of print, which fact has induced us to bring out the present new and enlarged publication.

In this new work we present to our friends an exhaustive treatise on the dyeing of unions based on the present state of this industry.

We trust that the present work will, like our previous publications, be appreciated by our customers.

Frankfort o. M., February 1906.

Leopold Cassella & Co
G. m. b. H.

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On account of the liability of **Nitrazol C**, pat., to spontaneous combustion, we do not carry this article in stock. Wherever the use of same is mentioned in this hand-book, we recommend, instead, the use of diazotized **Paranitraniline**, for the coupling of our colors. The final result is exactly the same.

CASSELLA COLOR COMPANY.

B.

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A.

General Part.

The Dyeing of Unions.

Being the simplest method, the *one-dip process* of dyeing unions in a neutral bath is of chief importance and, as heretofore, still enjoys the greatest popularity. The *two-bath method* comes next into consideration and is applied chiefly for goods which on account of their texture are not adapted for dyeing in a neutral bath or the bottoming of which (as for instance in the case of shoddy materials) renders the employment of acid baths a necessity.

As is generally known, the dyeing of unions according to the *one-dip process,* both in the piece and in the yarn or loose state, is carried out either with Diamine Colours or, if these do not give the desired shades alone, with Diamine Colours in combination with such wool dyestuffs as may be applied in a neutral bath.

The Diamine Colours vary in their affinity to animal and vegetable fibres inasmuch as a certain number of them dye both wool and cotton a uniform shade, whereas others dye one fibre deeper than the other, others again dyeing wool and cotton different shades.

The last mentioned group is of minor importance for union dyeing; the other Diamine Colours we divide into three groups, according to their behaviour towards the different fibres, as follows:

Group I: Diamine Colours which dye wool and cotton practically the same shade;

Group II: Diamine Colours which dye the cotton deeper than the wool;

Group III: Diamine Colours which dye the wool deeper than the cotton;

to which should be added

Group IV: Wool Colours (Acid Colours) which dye wool in a neutral bath, leaving cotton undyed.

In order to obtain solid shades on union goods, combinations of Diamine Colours are used, suitable wool dyestuffs being in most cases also added in order to shade and brighten the wool.

The *two-bath method* — first dyeing the wool in an acid bath and subsequently covering the cotton in a cold bath with Diamine Colours — is mostly applied for fancy and mode shades and for greys. In the case of blacks, dark browns and dark blues, the reverse method, i. e. dyeing the cotton first in a moderately warm bath with Diamine Colours and subsequently covering the wool in an acid bath, is likewise suitable.

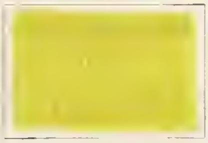
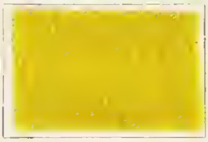
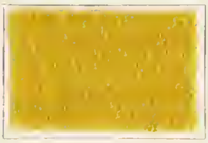
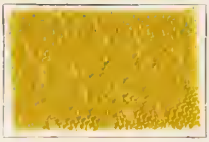
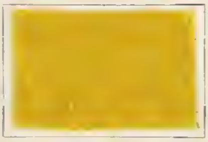
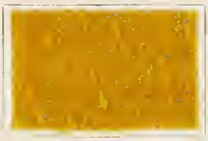
The behaviour towards wool and cotton of the different Diamine and Acid Colours suitable for the one-dip process will be seen from the tables given on the following pages.

The patterns shown have been dyed for about 1 hour just below the boil in a bath charged with 2—4 lbs cryst. Glauber's salt per 10 gallons liquor.

Group I.

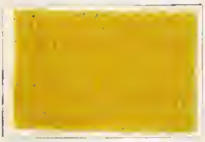
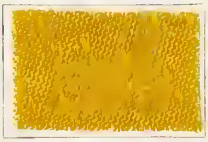
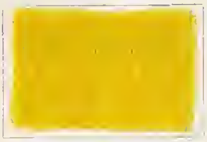
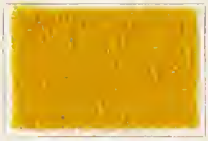
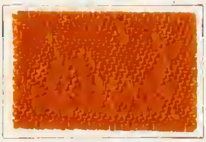
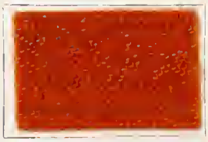
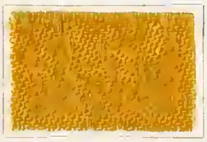
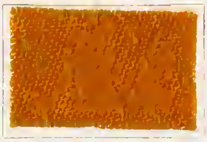
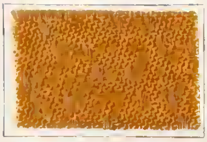
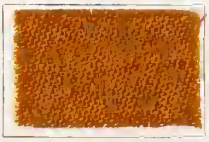
Diamine Colours

which dye wool and cotton practically a solid shade.

Name of the Colour	Application
Thioflavine S pat. 1 %  2 % 	*Dyes very bright lemon yellows and serves for shading pale bright greens.* *It resists discharging agents well and is therefore used for printing yellow discharge effects.*
Oxy Diamine Yellow GG 1 % 2 % 	*Oxy Diamine Yellow G G and T Z dye somewhat redder shades of yellow than Thioflavine S and are used for producing yellows, as also for shading greens and olives.* *Both products are suitable for dyeing in a cold bath.*
Oxy Diamine Yellow TZ 1 % 2 % 	
Diamine Fast Yellow FF pat. 1 %  2 % 	*Exceedingly fast to light; is used for yellows, greens, etc.*

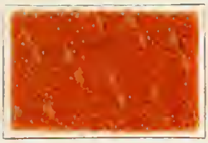
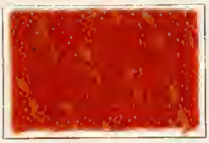
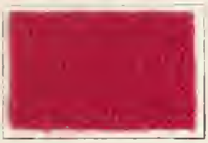
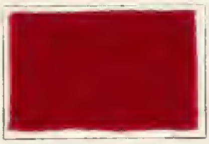
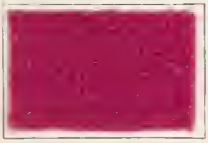
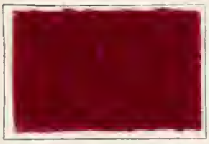
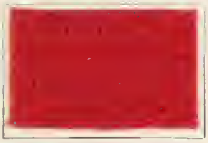
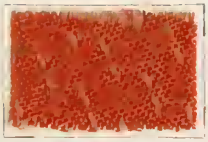
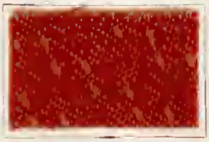
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Fast Yellow B pat. 1 %  2 % 	*This colour is the most important yellow constituent for mixtures of all kinds on every class of material. It dyes cotton a little deeper than wool and is exceedingly fast to light.*
Diamine Fast Yellow M pat. 1 %  2 % 	*Is used for the same purposes as Diamine Fast Yellow B, but dyes the wool a little more than the latter.*
Diamine Orange B 1 %  2 % 	*Very suitable for shading purposes, especially for mode shades.*
Oxy Diamine Orange G 1 %  2 % 	*On account of its full shade, suitable for producing olives and green-olives.*
Oxy Diamine Orange R 1 %  2 % 	*Same as Oxy Diamine Orange G.*

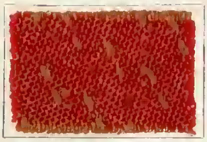
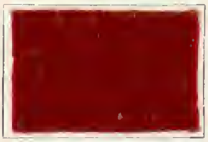
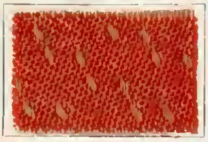
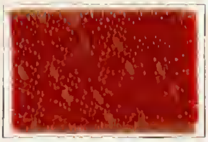
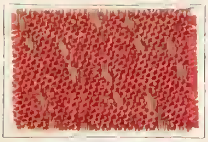
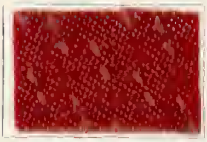
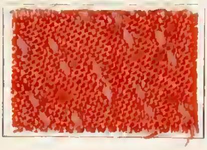
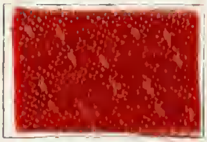
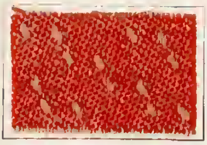
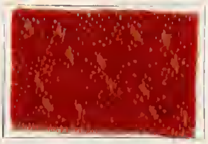
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Orange F 1 %  2 % 	*Dyes a very bright orange which goes easily on to wool; very suitable for shading reds.*
Diamine Rose GD pat. 1 %  2 % 	*Dyes wool and cotton fairly solid shades and is used alone or in combination with Rosazeïne especially for producing pinks.* *Very suitable for dyeing in a cold bath.*
Diamine Rose BD pat. 1 %  2 % 	*Dyes the wool rather deeper than Diamine Rose GD and is applied for the same purposes as the latter.*
Oxy Diamine Red S 1 %  2 % 	*Dyes cotton rather deeper than Diamine Rose and is distinguished from the Diamine Reds mentioned below by its very good fastness to acids.* *Very suitable for dyeing in a cold bath.*
Diamine Red 4B 1 %  2 % 	*Suitable for cheap and bright shades of scarlet, as well as for shading clarets, on all kinds of goods.*

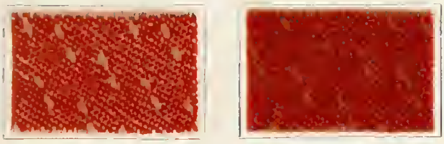
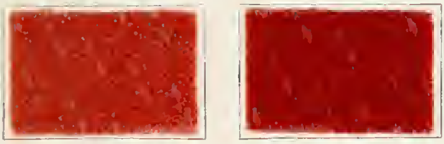
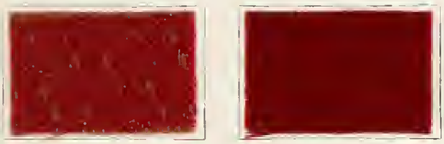
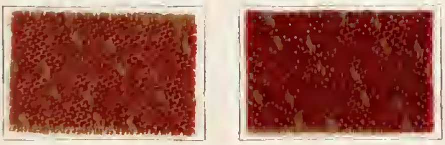
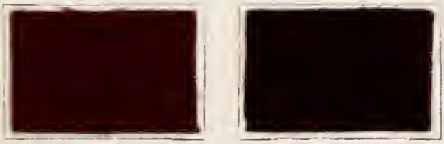
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Red 5B 1 %  2 % 	*Same as Diamine Red 4B.*
Diamine Red 6B 1 %  2 % 	
Diamine Red 10B pat. 1 %  2 % 	*Behaves similarly to Diamine Red 4B and is used as a bluish red for red and claret shades.* *Very suitable for dyeing in a cold bath.*
Diamine Purpurine B 1 %  2 % 	*Very suitable for bright red shades on all kinds of half-wool materials; is used as a substitute for Diamine Red 4B when a red faster to acids is required.*
Diamine Purpurine 3B 1 %  2 % 	*Same as Diamine Purpurine B.*

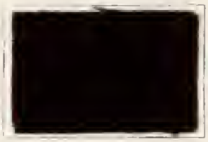
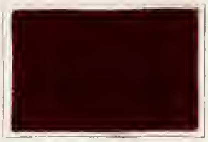
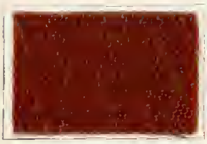
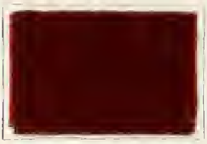
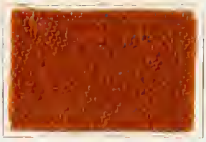
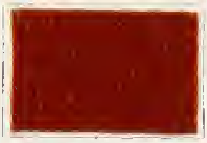
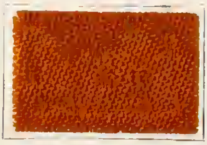
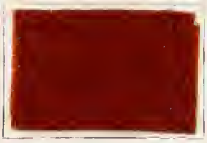
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Purpurine 6B 1 % 2 % 	*Is used like Diamine Purpurine B and is very suitable for dyeing in a cold bath.*
Diamine Brilliant Scarlet S 1 % 2 % 	*Does not tint the wool to quite the same extent as Diamine Purpurine and is much superior to the latter in fastness to acids.*
Diamine Fast Red F 1 % 2 % 	*Serves for producing deep reds and claret reds fast to acids, and in combination with Diamine Red 10 B yields good full shades. It is especially important on account of its good fastness to light and washing; the fastness to milling can be still further improved by an aftertreatment with chromium fluoride or bichromate of potash.*
Diamine Bordeaux VR0 1 % 2 % 	*Well suited for cheap claret shades.*
Diamine Brown M 1 % 2 % 	*This brand is used more than any other for full shades of brown on unions.* *It dyes the cotton a little deeper than the wool and is one of the best Diamine Browns with regard to fastness to light.*

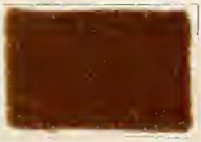
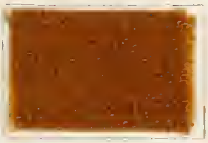
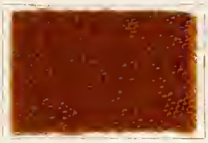
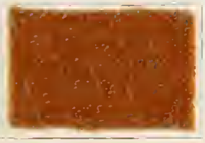
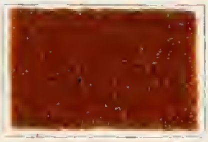
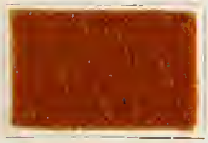
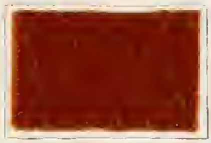
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Brown B pat. 1 % 2 % 	*Dyes the wool a little deeper than the cotton and is used principally for dark shades.*
Diamine Brown R 1 % 2 % 	*Dyes wool and cotton almost exactly the same shade and is used largely for producing all kinds of browns.*
Diamine Brown GWA pat. 1 %  2 % 	*Dyes the cotton a little deeper than Diamine Brown R and is applied for the same purposes as the latter.*
Diamine Brown BWA pat. 1 %  2 % 	*Are used very largely as yellow-browns, dyeing solid shades on wool and cotton.*
Diamine Brown 3G 1 %  2 % 	

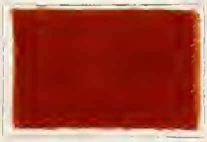
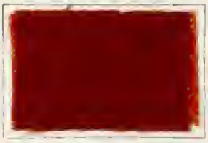
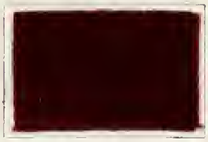
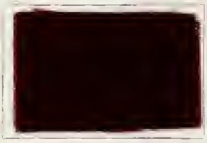
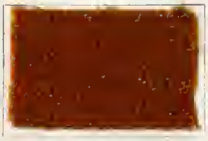
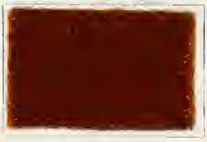
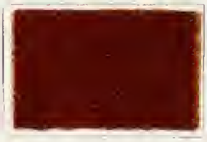
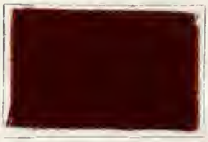
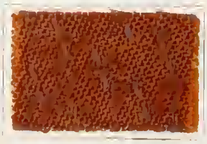
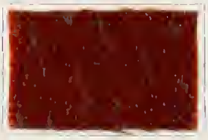
Diamine Colours.

(Group I)

Name of the Colour	Application
Union Brown TD pat. 1 % 2 % 	*Serves for the production of olive-brown shades; it dyes the cotton a little deeper than the wool.*
Diamine Catechine G pat. 1 %  2 % 	*Used largely as shading colours for brown, olive and mode shades.*
Diamine Catechine 3G pat. 1 %  2 % 	
Oxy Diamine Brown G 1 %  2 % 	*Used largely for bright browns and for shading modes.*
Oxy Diamine Brown 3GN 1 %  2 % 	

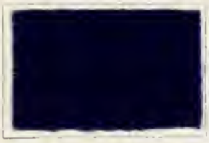
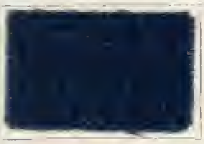
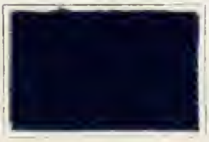
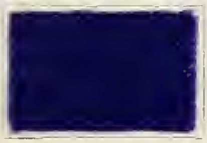
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamineral Brown G pat. 1 %  2 % 	*Belongs to the browns possessing the best fastness to light; it is very suitable for the production of yellow-brown, brown and dark mode shades.*
Diamine Brown 30a pat. 1 %  2 % 	*Is used as a cheap substitute for Diamine Brown M, being of the same shade and similar in its behaviour towards wool and cotton.*
Diamine Brown 33 pat. 1 %  2 % 	*Is applied as a cheap dyestuff for the production of yellow-brown and olive shades.*
Diamine Brown 37 pat. 1 %  2 % 	*A cheap brown well adapted for the production of brown and other mode shades.*
Diamine Brown 40 pat. 1 %  2 % 	*Behaves like Diamine Brown R and is used in the same manner.*

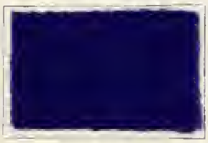
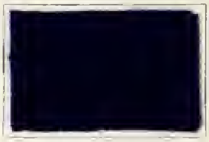
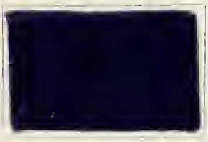
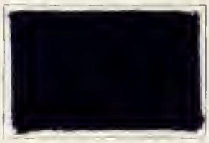
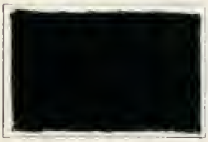
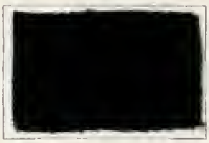
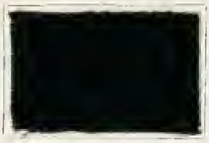
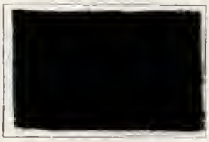
Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Brown 42a pat. 1 % 2 %	*Is a favourite dyestuff for producing brown and other mode shades.*
Diamine Blue RW pat. 1 % 2 % 	*Dyes the cotton a little deeper and brighter than the wool, and is used in combination with Lanacyl Blue, Formyl Blue or Brilliant Milling Blue for the production of bright blues.*
Diamine Steel Blue L pat. 1 %  2 % 	*Is especially well adapted for producing greenish blue shades; dyes very level.*
Union Blue BB pat. 2 % 4 %	*Covers cotton and wool well, and is especially suitable for full navy blue shades.*
Union Blue BJ pat. 2 %  4 %	*Dyes wool and cotton very evenly, and is used for the production of bright blues.*

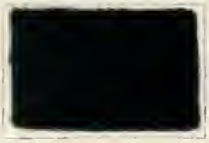
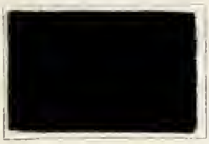
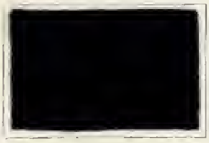
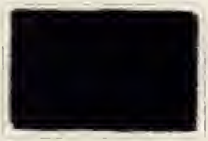
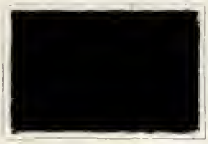
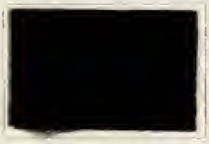
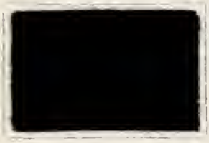
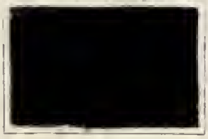
Diamine Colours.

(Group I)

Name of the Colour	Application
Union Blue RJ pat. 2 %  4 % 	*Somewhat redder and brighter than Union Blue BJ and applied in the same manner.*
Diaminogene B pat. 1 %  2 % 	*Belongs to the dyestuffs possessing the very best fastness to light and is very well adapted for mode shades on account of its good levelling power.*
Diamine Green B pat. 1,5 %  2,5 % 	*Is used principally for dark greens and Russian greens both alone and in combination with Diamine Black HW, Naphtol Blue Black or Brilliant Milling Green B on half-wool goods of every description.*
Diamine Green G pat. 1,5 %  2,5 %	*Is brighter and possesses a more yellowish shade than Diamine Green B; it is applied like the latter.*
Diamine Dark Green N pat. 1,5 % 2,5 % 	*Is used for the same purposes as Diamine Green B and G, particularly for the production of dark greens and olives.*

Diamine Colours.

(Group I)

Name of the Colour	Application
Diamine Green CL pat. 1,5 %  2,5 % 	*A somewhat brighter and more bluish green than the other brands of Diamine Green and is applied in the same manner.*
Diamine Black HW pat. 1 % 2 % 	*A greenish black which dyes the cotton a little deeper than the wool and is of special value as a shading product for green, olive-green and Russian green.*
Union Black S pat. 2,5 %  5 % 	*Is the black used more than any other for dyeing unions; it covers the cotton well and yields dyeings of good fastness to light. Like Diaminogene B it is used as a saddening agent for mode shades and blues.*
Oxy Diamine Black BM pat. 2,5 %  5 % 	*Possesses somewhat greater depth of shade than Union Black S and is applied like the latter.*
Union Fast Black J pat. 2,5 %  5 %	*A product of excellent fastness to light; especially suitable as a jet black for better-class goods.*

Diamine Colours.

(Group I)

Name of the Colour	Application
Union Black P pat. 2,5 % ■ 5 % ■	*Dyes the wool deeper than Union Black S and, shaded with Indian Yellow, yields very deep blacks.*
Union Black BG pat. 2,5 % ■ 5 % ■	*Similar to Union Black P, but dyes more bluish shades of black.*
Union Black BB pat. 2,5 % ■ 5 % ■	*Very level-dyeing colours of good fastness to light which differ from Union Black P and BG in their more greenish tone.*
Union Black 3B pat. 2,5 % ■ 5 % ■	
Union Jet Black B pat. 2,5 % ■ 5 % ■	*A cheap black which covers both wool and cotton well; in other respects like Union Black P and BG.*

Diamine Colours.

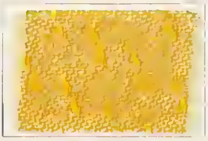
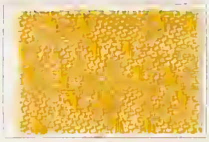
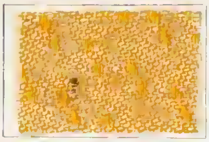
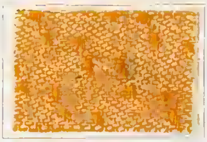
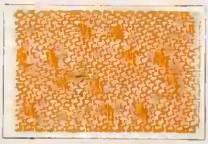
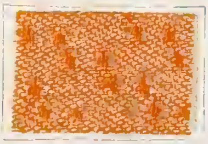
(Group I)

Name of the Colour	Application
Oxy Diamine Black JEI pat. 2,5 % 5 %	*Cheap brands of Black used either alone or in combination with Naphtylamine_Black.* *Compared with the older brands A, D, SA etc., they are faster to light and behave more favourably in dyeing, bronzy effects being avoided even when dyeing in standing baths.*
Oxy Diamine Black JB pat. 2,5 % 5 %	
Oxy Diamine Black JW pat. 2,5 % 5 %	
Oxy Diamine Black JWF pat. 2,5 % 5 %	
Oxy Diamine Black FFC pat. 2,5 % 5 %	

Group II.

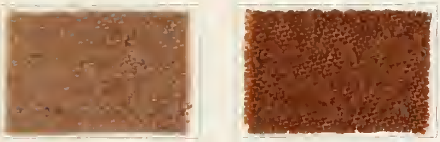
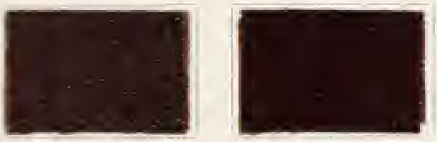
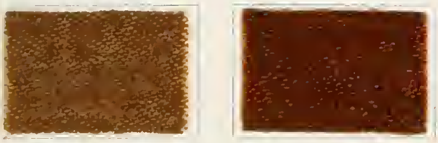
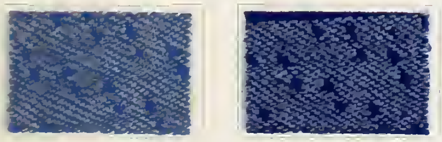
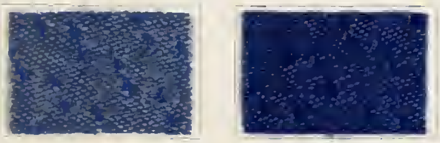
Diamine Colours

which dye the cotton deeper than the wool.

Name of the Colour	Application
Diamine Fast Yellow A 0,75 %  2 % 	*Even in a boiling bath it will dye the cotton fibre almost exclusively, and is used to a large extent both for shading cotton yellow and for producing two-coloured effects. It is also especially well adapted for dyeing in a cold bath.*
Diamine Orange G 0,75 %  2 % 	*Is a little redder than Diamine Fast Yellow A, otherwise behaving like this brand.*
Diamine Orange D 0,75 %  2 % 	*Dyes the cotton exclusively and is used a great deal for shading mode, brown and olive shades of all kinds, as well as for reds and clarets. It is likewise very well adapted for dyeing in a cold bath.*

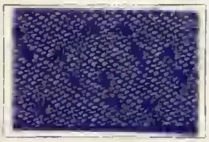
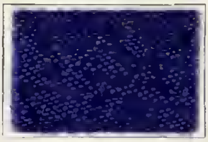
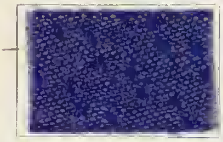
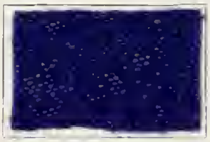
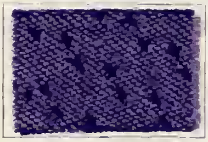
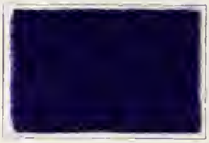
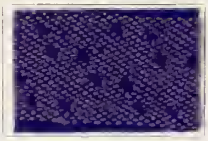
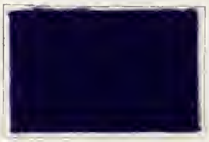
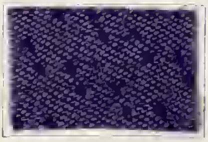
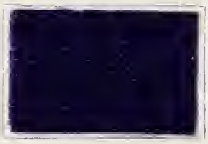
Diamine Colours.

(Group II)

Name of the Colour	Application
Diamine Nitrazol Brown G pat. 0,75 % 2 % 	*Behaves similarly to Diamine Orange D. On account of its more reddish shade it is suitable for shading browns and as a reddening agent for mode shades if the cotton is to be particularly well covered.* *This product is very well suited for dyeing in a cold bath.*
Diamine Catechine B pat. 0,75 % 2 % 	*Is used principally for shading modes, for which it is particularly well suited on account of its soft brown shade and its property of dyeing the cotton a deeper shade than the wool.*
Oxy Diamine Brown RN 0,75 % 2 % 	*Dyes a yellower shade than Diamine Nitrazol Brown G, but is applied like the latter.*
Diamine Sky Blue 0,75 % 2 % 	*Is used for producing pale, bright blues and greens, for which purpose it is shaded with Alkaline Blue, Brilliant Milling Blue, Thioflavine S etc. Exhausts very well in a cold bath and is on this account used to a considerable extent for producing dyeings by the two-bath method.*
Diamine Sky Blue FF pat. 0,75 % 2 % 	*Brighter in shade than Diamine Sky Blue, and dyes the wool a little deeper than the latter.*

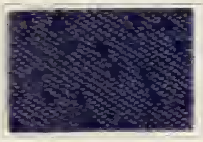
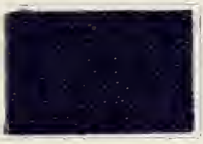
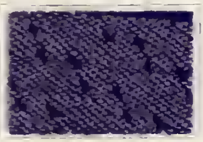
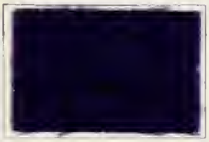
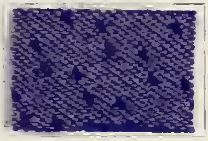
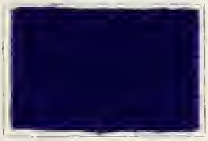
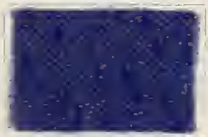
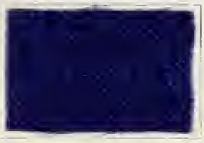
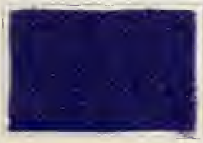
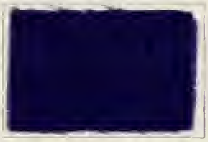
Diamine Colours.

(Group II)

Name of the Colour	Application
Diamine Blue 2B 0,75 %  2 % 	*These two colours dye bright shades of blue which are fuller than those of Diamine Sky Blue and are frequently used in conjunction with Alkaline Blue, Formyl Blue and Brilliant Milling Green.* *The products are likewise very well suited for dyeing in a cold bath.*
Diamine Blue 3B 0,75 %  2 % 	
Diamine Blue BG 0,75 %  2 % 	*Covers the cotton very well. Is used for navies, being darkened by the addition of black and supplemented with suitable wool dyestuffs.*
Diamine New Blue R pat. 0,75 %  2 % 	*Same as with Diamine Blue B G.*
Diamine Blue NC pat. 0,75 %  2 % 	*Behaves similarly to Diamine Blue B G; dyes the wool still less and is used in conjunction with Lanacyl Blue and Formyl Blue for fine, bright medium blue shades.*

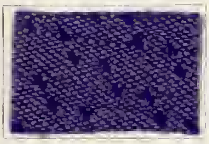
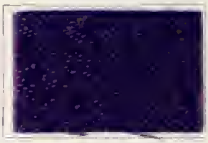
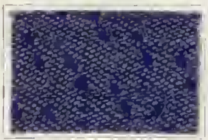
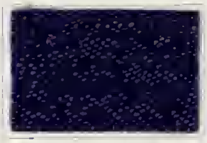
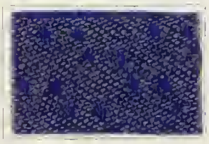
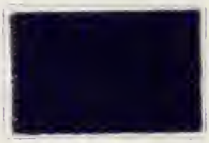
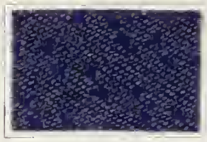
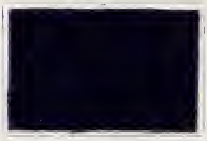
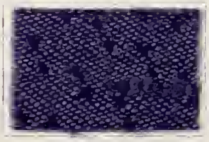
Diamine Colours.

(Group II)

Name of the Colour	Application
Diamineral Blue R pat. 0,75 %  2 % 	*Same as with Diamine Blue N C.*
Diamineral Blue CV 0,75 %  2 % 	*Redder and brighter than Diamineral Blue R and used for shading the cotton for dark and medium blue shades.*
Diamine Brilliant Blue G pat. 0,75 %  2 % 	*Dyed in conjunction with Alkaline Blue, Diamine Brilliant Blue G yields very bright, solid shades of blue and is used also for shading the cotton in the case of medium and dark blues.*
Oxy Diamine Blue 5G 0,75 %  2 % 	*These two dyestuffs are used largely as cheap, bright blues and like Diamine Blue N C are supplemented with suitable wool colours.*
Oxy Diamine Blue 3G 0,75 %  2 % 	

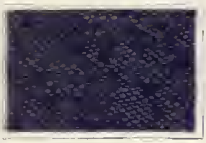
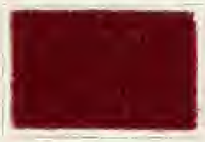
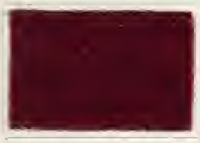
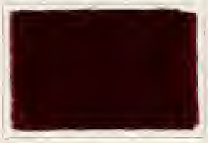
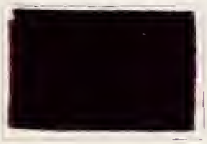
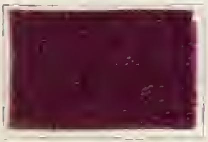
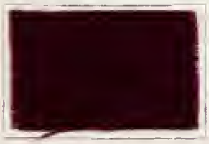
Diamine Colours.

(Group II)

Name of the Colour	Application
Oxy Diamine Blue G 0,75 %  2 % 	*Is used like Oxy Diamine Blue 3 G.*
Diamine Fast Blue FFB pat. 0,75 %  2 % 	*The great advantage of the Diamine Fast Blues is their excellent fastness to light, in which respect they are superior to any of the other substantive blues. These products dye principally the cotton and are applied in conjunction with wool dyestuffs fast to light such as Lanacyl Blue BB, R, Lanacyl Navy Blue B and Alkaline Blue.*
Diamine Fast Blue FFG pat. 0,75 %  2 % 	
Diamine Fast Blue G pat. 0,75 %  2 % 	
Diamine Black BH pat. 0,75 %  2 % 	*Dyes the wool only very slightly and as a blue for cotton is used to the very widest extent for every kind of shade.* *It is especially well suited for dyeing the cotton in a cold bath.*

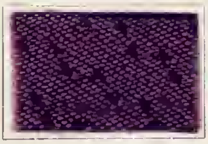
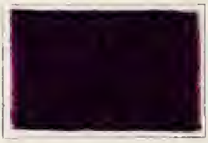
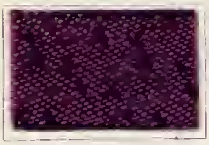
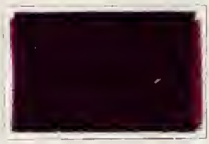
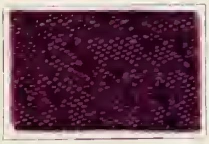
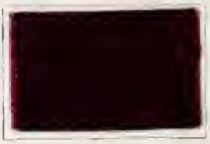
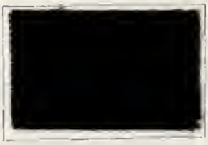
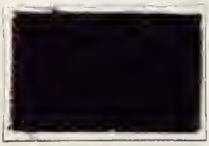
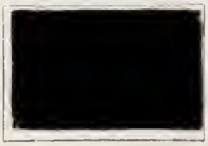
Diamine Colours.

(Group II)

Name of the Colour	Application
Diamine Dark Blue B pat. 0,75 %  2 %	*Is largely used in conjunction with Diaminogene extra or Lanacyl Blue for producing mode shades fast to light.*
Diamine Bordeaux B 0,75 % 2 % 	*Is used to a large extent for claret and reddish brown shades as well as for the shading of mode colours.*
Oxy Diamine Violet G pat. 0,75 %  2 % 	*These products are used principally for saddening claret, reddish violet and similar shades and are also very well adapted for dyeing in a cold bath.*
Oxy Diamine Violet B pat. 0,75 % 2 % 	
Diamine Violet N 0,75 %  2 % 	*This is a very clear violet possessing good fastness to light and used for producing pale, bright shades of violet and heliotrope.*

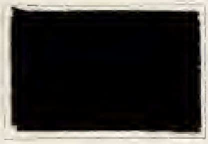
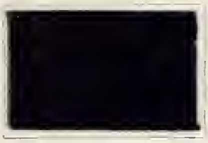
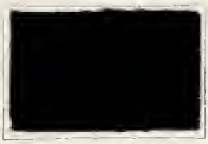
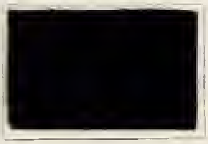
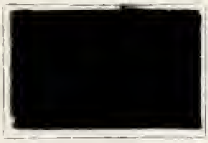
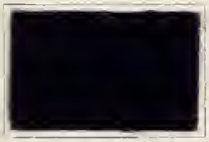
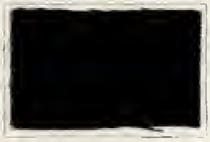
Diamine Colours.

(Group II)

Name of the Colour	Application
Diamine Heliotrope B 0,75 %  2 % 	*These products go chiefly on to the cotton and are therefore used principally for shading the cotton in the case of heliotropes and navies.* *All three products are very well adapted for dyeing in a cold bath.*
Diamine Heliotrope 0 0,75 %  2 % 	
Diamine Heliotrope G pat. 0,75 %  2 % 	
Diamine Fast Black F pat. 2,5 % 5 % 	*Diamine Fast Black F is one of the best blacks for fastness to light, in which respect it compares very favourably with the Diamine Fast Blues. It dyes the cotton decidedly more deeply than the wool and is therefore used for blacks in combination with Naphtylamine Black or Neutral Wool Black.*
Oxy Diamine Black A pat. 2,5 %  5 % 	*Dyes the cotton very deeply and is very largely used in combination with Naphtylamine Black for cheap blacks.*

Diamine Colours.

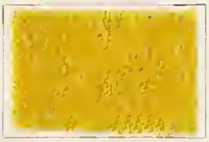
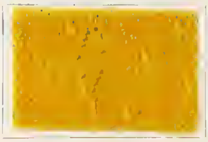
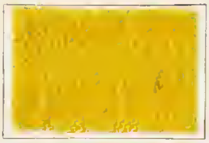
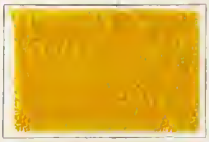
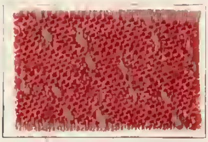
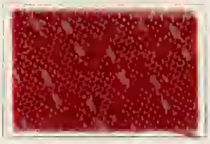
(Group II)

Name of the Colour	Application
Oxy Diamine Black D pat. 2,5 % 5 % 	*Dyes a more greenish shade than Oxy Diamine Black A and is used like the latter.*
Oxy Diamine Black SA pat. 2,5 %  5 % 	*These brands are used in the same way as Oxy Diamine Black A, likewise serving as blacks fast to acids for cotton-dyeing goods the wool of which is to be cross-dyed in an acid bath.*
Oxy Diamine Black US pat. 2,5 %  5 % 	
Para Diamine Black B pat. 2,5 %  5 % 	
Para Diamine Black BB pat. 2,5 % 5 %	

Group III.

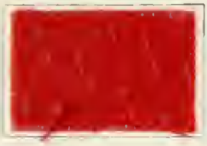
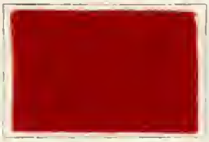
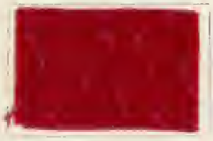
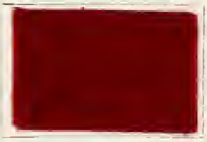
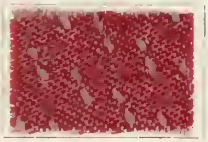
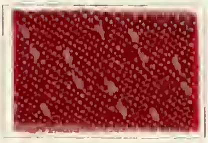
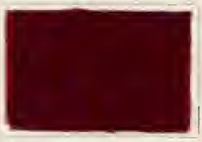
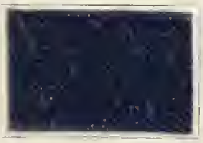
Diamine Colours

which dye the wool deeper than the cotton.

Name of the Colour	Application
Diamine Gold 0,75 %  2 % 	*A very bright yellow which in combination with Diamine Fast Yellow A yields very fine and solid shades.*
Diamine Yellow CP 0,75 %  2 % 	*Distinguished for its excellent fastness to light and also used in combination with Diamine Fast Yellow A.*
Diamine Red 101 J pat. 0,75 %  2 % 	*A bluish red for the production of reds and clarets.*

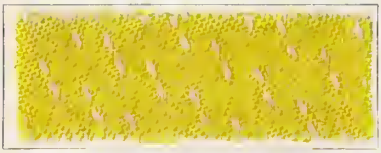
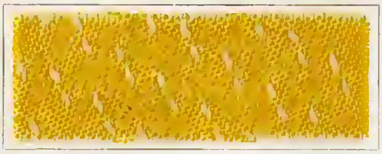
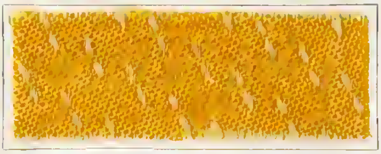
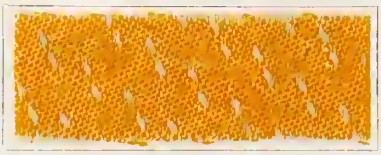
Diamine Colours.

(Group III)

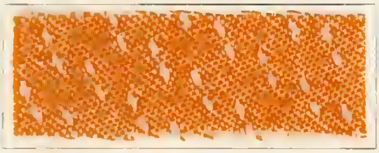
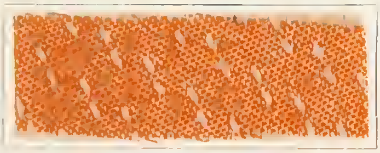
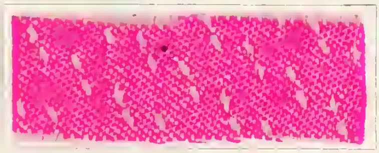
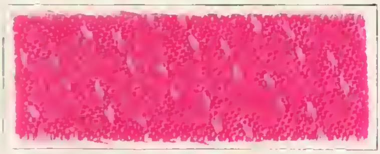
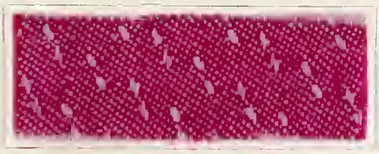
Name of the Colour	Application
Diamine Scarlet B 0,75 %  2 % 	*Diamine Scarlet B is the brightest of the direct-dyeing reds and as such is used for producing brilliant shades of scarlet. Owing to the fact that it dyes the wool very well, it is also used frequently for brightening other reds.* *Diamine Scarlet 3B dyes a very bright bluish red and is applied in the same way as the B brand.* *Diamine Scarlet B and 3B are dyed to best advantage with the addition of 5–8 % borax or 1–1½ % soda and 4 lbs cryst. Glauber's salt per 10 gallons liquor at a temperature of 80–90° C. (175–195 deg. F.).*
Diamine Scarlet 3B 0,75 %  2 % 	
Diamine Violet Red pat. 0,75 %  2 % 	*Are applied in combination with Diamine Bordeaux B for producing claret shades.*
Diamine Bordeaux S 0,75 %  2 %	
Diaminogene extra pat. 0,75 %  2 %	*A dyestuff possessing very good fastness to light used in combination with Diamine Dark Blue B or Diaminogene B for producing greys and mode shades on piece-goods and loose material.*

Group IV.

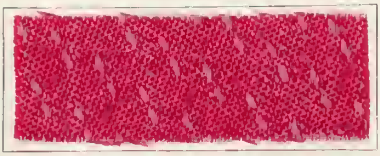
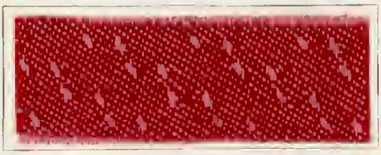
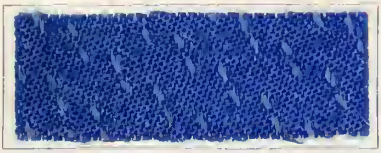
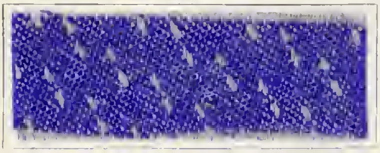
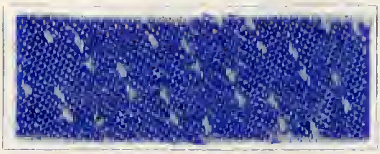
Neutral-dyeing Wool Colours.

Name of the Colour	Application
Naphtaline Yellow crystals 1 % 	*Serves as a supplementary colour to Thioflavine S and Oxy Diamine Yellow for bright yellow and green shades.*
Indian Yellow G 1 % 	*Indian Yellow G and the very similar but somewhat brighter brand Indian Yellow FF are used as yellow constituents for mode colours and all kinds of deep shades.*
Indian Yellow R 1 % 	*Yellow constituents of great intensity for olive, green-olive, brown and mode shades.*
Tropaeoline 00 1 % 	

Neutral-dyeing Wool Colours. (Group IV)

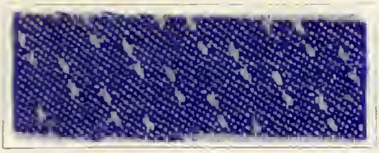
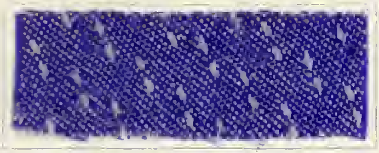
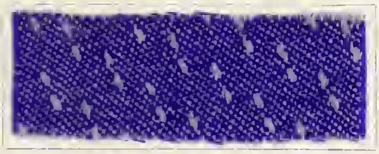
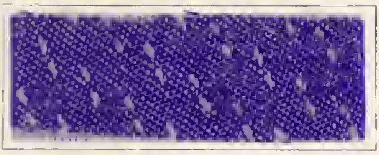
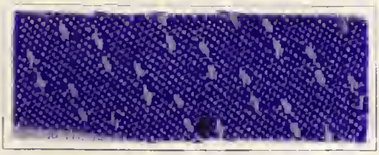
Name of the Colour	Application
Orange extra 1 % 	*These two brands are used extensively for shading the wool.*
Orange ENZ 1 % 	
Rosazeïne 13 1 % 	*Are chiefly used for producing bright pink and red shades in combination with Diamine Rose GD and BD.* *Irisamine G stains the cotton also to some extent.*
Irisamine G pat. 1 % 	
Azo Red A 1 % 	*Serves chiefly for reddening mode colours on wool.*

Neutral-dyeing Wool Colours. (Group IV)

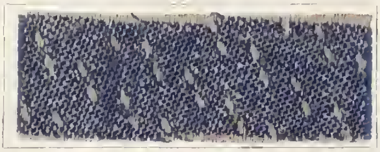
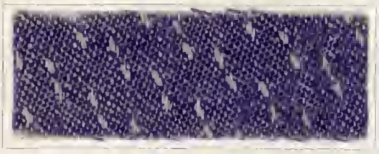
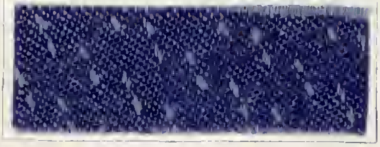
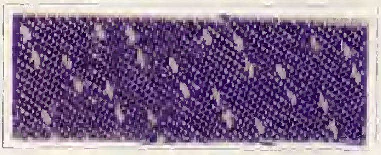
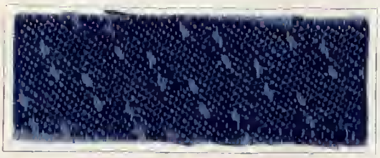
Name of the Colour	Application
Croceïne AZ 1 % 	*Is a red very fast to light and used with advantage for shading browns, reds and clarets.*
Roccelline 1 % 	*Dyes the wool very readily in a neutral bath and is well suited for the production of reds and clarets.*
Alkaline Blue 5B 1 % 	*All the Alkaline Blues serve as supplementary colours to Diamine Blue and Diamine Sky Blue for the production of bright shades of pale and medium blue.* *After dyeing, Alkaline Blue must always be developed in acidulated water.*
Formyl Blue B pat. 1 % 	*Is used for the same purpose as the Alkaline Blues and serves also as a blue fast to washing in shoddy dyeing.* *It does not require to be developed by souring off.*
Brilliant Milling Blue B pat. 1 % 	*Is of a brighter shade than Formyl Blue B and serves the same purposes; it likewise does not require to be developed by souring off.*

Neutral-dyeing Wool Colours.

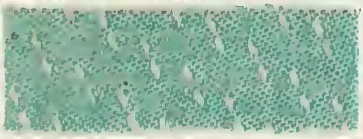
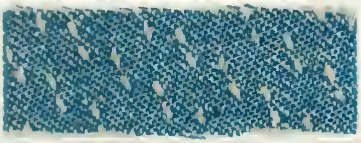
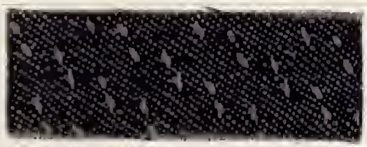
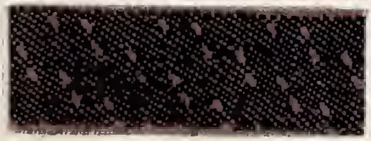
(Group IV)

Name of the Colour	Application
Formyl Violet 10B pat. 1 % 	*These brands represent the most important wool colours for the production of blues, navies, dark blues and purples. They are also used extensively in combination with Diamineral Blue and Diamine Jet Black for the production of dyeings fast to milling on shoddy.*
Formyl Violet 6B pat. 1 % 	
Formyl Violet S4B pat. 1 % 	
Formyl Violet HW pat. 1 % 	
Alkaline Violet CA pat. 1 % 	

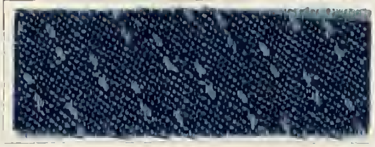
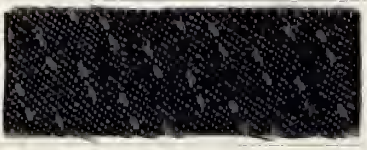
Neutral-dyeing Wool Colours. (Group IV)

Name of the Colour	Application
Lanacyl Blue BB pat. 1 % 	*Dyestuffs fast to light used for shading blue, violet and mode shades and other colours on wool.*
Lanacyl Blue R pat. 1 % 	
Lanacyl Navy Blue B pat. 1 % 	
Lanacyl Violet B pat. 1 % 	
Naphtol Blue G pat. 1 % 	*Behaves like the Lanacyl Blues and serves for the same purposes as the latter.* *A more reddish brand, otherwise possessing the same properties, is Naphtol Blue R pat.*

Neutral-dyeing Wool Colours. (Group IV)

Name of the Colour	Application
Brilliant Milling Green B 1 % 	*Exhaust very well from neutral baths and are used for shading the wool towards green and greenish blue.*
Thiocarmine R powder 1 % 	
Naphtylamine Black 6B 1 % 	*Are used most extensively in combination with Union Black and Oxy Diamine Black for covering the wool in all kinds of goods.* *Naphtylamine Black X2B and X3B are two other well covering brands otherwise possessing the same properties.*
Naphtylamine Black 4B 1 % 	
Naphtylamine Black D 1 % 	

Neutral-dyeing Wool Colours. (Group IV)

Name of the Colour	Application
Naphtol Blue Black 1 % 	*Very fast to light and used quite generally for shading mode, olive, green, blue and black shades.*
Neutral Wool Black G pat. 1 % 	*These products dye wool (and also silk) exceedingly well in a neutral bath, and are employed like the Naphtylamine Blacks in union dyeing.*
Neutral Wool Black B pat. 1 % 	

Methods of Dyeing.

Method of Procedure when dyeing in One Bath.

Method of Procedure when dyeing in Two Baths.

- A. Dyeing the Wool before the Cotton.
- B. Dyeing the Cotton before the Wool.

The Production of "Sulphured" or "Stoved" Dyeings.

Methods of Stripping dark Shoddy Materials.

One-Dip Process.

Preparation of the Goods.

Like piece-goods generally, union materials have to be well washed and prepared before dyeing; in the case of pale shades a previous bleaching is sometimes to be recommended.

When dyeing pale shades the goods are wetted out before dyeing, while for dark shades the goods may be entered dry.

Dye-vessels.

For piece-goods, the ordinary vat with a winch is used, being heated by either direct or indirect steam; the latter is to be preferred as being applicable without causing a dilution of the liquor.

The steam-pipes are fixed in the small partition usually provided for this purpose which serves also for adding the dyestuff solutions and the Glauber's salt.

To economise in steam, the vats are sometimes covered with a wooden hood, but such an arrangement is only to be recommended when dyeing staple shades, as it is a little hampering in handling the goods.

For dyeing yarns and braids, the ordinary rectangular wooden vat is used; loose material, rags, etc. are best dyed in round copper kettles or wooden tubs. The above remarks with regard to heating also apply here.

Dye-vats which have been used for dyeing with acid should be well cleared by boiling with soda in order to neutralise the acid which has penetrated into the wood.

Method of Dyeing.

Dye in a boiling bath or just below the boil, with the addition of

2 lbs desiccated Glauber's salt or } per 10 gallons liquor
4 „ cryst. Glauber's salt

for *dark* and *medium* shades, and with

$^1/_2$—1 lb desiccated Glauber's salt or } per 10 gallons liquor
1—2 lbs cryst. Glauber's salt

for *pale* shades.

When dyeing subsequent lots in a standing bath, one-fifth of these additions is sufficient.

For certain dyestuffs the addition of a small quantity of alkali, borax or soda to the dyebath is to be recommended as indicated on page 37 for Diamine Scarlet, partly to prevent the wool from absorbing the dyestuff too rapidly, partly also to facilitate the penetration of very hard, tightly woven fabrics.

The Glauber's salt used must not be acid, as the wool will otherwise absorb the dyestuffs too readily. It is therefore advisable always to test the salt beforehand with moistened blue litmus paper, which must not turn red.

Volume of Liquor.

For deep shades the liquor should be as concentrated as possible, not exceeding about 25 times the weight of the goods to be dyed, whilst for pale shades it is recommended to dye in a more dilute bath.

Temperature of the Dyebath.

The most important means for producing solid shades is a suitable regulating of the temperature. Below the boiling point the Diamine Colours dye the cotton principally, and only at the boil will the wool be effectively covered.

The following

Method of Working

has been found to answer best in practice:

For *pale* shades enter the well wetted out goods into the warm bath charged with Glauber's salt and dyestuff, raise gradually to the boil, and boil until the wool has assumed the desired depth of shade.

In the case of *dark* shades, boil the bath previously charged with Glauber's salt and dyestuff, and after shutting off steam enter the dry or wetted out goods, matching after $^1/_2$ hour's dyeing.

In matching, the following possibilities may have to be taken into consideration:

a) The cotton may be deficient in depth of shade.

In such case the goods are left to feed in the bath whilst cooling off, such dyestuffs as dye the cotton deeper than the wool being if necessary added (group II).

b) The shade of the wool may be still too light.

The bath is allowed to boil gently until the wool has assumed the desired depth of shade.

c) The required shade may not yet be attained, or both cotton and wool may still be too light in colour.

The quantities of dyestuff still necessary are then added, and after the bath has been boiled up, the goods are allowed to run for another $^1/_4$ to $^1/_2$ hour without steam.

When boiling up repeatedly, it has to be observed that the wool is apt to assume a deeper shade than the cotton; prolonged or too severe boiling should therefore be avoided if possible.

When dyeing red shades with *Diamine Scarlet,* add 5—8 % borax or 1—1$^1/_2$% soda ash to the dyebath in addition to the Glauber's salt; enter the goods into the tepid bath, and raise the temperature gradually until the wool is also dyed sufficiently, which, according to the absorbtive property of the particular kind of wool, will take place at 60—80° C. (140—175 deg. F.)

Preserving the Dyebaths.

The dyebaths for dark shades are generally not exhausted and may be preserved for further use.

Owing however to the difficulty of keeping standing baths for each shade, more especially in small dyeing establishments, different shades are frequently dyed one after the other in the same bath; one separate bath may, for instance, be used for the various mode shades, one for black and dark blue, one for brown and olive, etc.

Two-bath Method.

Dyeing by the two-bath method is usually resorted to for goods which suffer by dyeing in a hot, neutral bath or which cannot be dyed bright enough or sufficiently level by the one-dip process.

Either the wool is first dyed in a hot acid bath with suitable dyestuffs, the cotton being covered subsequently in a cold or tepid bath with Diamine Colours, or the goods are first cotton-dyed with dyestuffs fast to acids and wool-dyed subsequently in an acid bath.

The different methods applied in practice are the following:

A. Dyeing the wool first and the cotton subsequently.

For *dyeing the wool,* any of our easily levelling colours are suitable, viz:

For Yellow and Orange:

Naphtol Yellow S
Acid Yellow AT
Indian Yellow G, R, FF
Orange extra II, R, ENZ
Tropaeoline 00.

For Pink and Red:

Rosazeïne B
Irisamine G
Scarlet FR, F2R, F3R
Brilliant Scarlet (all brands)
Crystal Scarlet 6R
Brilliant Cochineal 2R, 4R
Lanafuchsine SG, SB
Azo Rubine A
Naphtol Red C, EB.

For Claret:

Naphtol Red C
Amaranth
Brilliant Orseille C
Lanafuchsine 6B
Azo Wool Violet 7R
  shaded with
    Cyanole extra
    Cyanole Green B, 6G
    Tetra Cyanole V
    Orange II, extra
    Acid Yellow AT.

For Violet:

Azo Wool Violet 4B
Acid Violet 6BS, 6BC
Formyl Violet 10B, 6B, S4B
Alkaline Violet CA.

For Blue:

Cyanole extra, FF, AB
Tetra Cyanole V, SF, extra
Indigo Blue N, SGN
Azo Wool Blue SE, SER
Azo Navy Blue B, 3B
Acid Navy Blue A
Formyl Blue B
Brilliant Milling Blue B.

For Green and Olive:

Cyanole extra
Fast Acid Green B, BN
Cyanole Green B, 6G
Cyanole Fast Green G
Brilliant Milling Green B
  shaded according to requirement with
    Naphtol Yellow S
    Acid Yellow AT
    Indian Yellow G, FF
    Orange II, extra
    Azo Orseille BB
    Lanafuchsine SB.

For Mode Shades and Olive:

Combinations of

Naphtol Yellow S
Acid Yellow AT
Orange II, extra
Azo Orseille BB
Lanafuchsine SB
Cyanole Green B, 6G
Cyanole Fast Green G
Tetra Cyanole V
Indigo Blue N.

For Black:

Naphtylamine Black 4B, 6B, X2B, X3B, etc.
Naphtylamine Black S, 4BS, 6BS, T, TJ, ESN, ES3B, EFF, etc.
Naphtol Black 3B, 6B
Azo Merino Black 6BE, B, BE

shaded according to requirement with

Orange II, extra
Acid Yellow AT
Cyanole Green B, 6G, etc.

The dyeing is carried out in the manner customary for all-wool piece-goods with the addition of

10—15 % bisulphate of soda
or
10 % cryst. Glauber's salt and
3— 5 % sulphuric acid

in a boiling bath.

After dyeing, the goods are well rinsed.

The goods are *cotton-dyed* in a very concentrated cold or lukewarm bath, either in the jigger, the washing-machine or the padding-machine with the Diamine Colours best adapted for the purpose and the following additions to the dyebath:

$1\frac{1}{2}$—3 oz ammonia or $\frac{3}{4}$—$1\frac{1}{2}$ oz soda ash
and
1 —2 lbs cryst. Glauber's salt for pale shades
or 4 „ cryst. Glauber's salt for deep shades

per 10 gallons liquor.

The following Diamine Colours are the most suitable for dyeing the cotton in a cold or lukewarm bath:

For Yellow and Orange:

Diamine Fast Yellow A, AR
Oxy Diamine Yellow TZ
Diamine Orange G, D.

For Pink and Red:

Diamine Rose BD, BG, GD
Cotton Red A
Oxy Diamine Red S
Diamine Red 10B
Diamine Purpurine 6B
Diamine Violet Red.

For Violet:

Oxy Diamine Violet B, R
Diamine Heliotrope B, G, 0.

For Blue:

Diamine Sky Blue (all brands)
Diamine Fast Blue FFB
Diamine Blue 2B, 3B
Diamine Brilliant Blue G
Diamine Black BH.

For Green:

Diamine Green G

or combinations of

Diamine Sky Blue (all brands)
Diamine Fast Blue FFB
Diamine Blue 2B, 3B
Diamine Black BH

with

Diamine Fast Yellow A, AR
Diamine Orange G, D
Oxy Diamine Yellow TZ.

For Grey:

Diamine Blue 2B, 3B
Diamine Sky Blue (all brands)
Diamine Black BH, RMW

shaded if required with

Diamine Fast Yellow A, AR
Diamine Orange D
Diamine Nitrazol Brown G
Diamine Rose GD, BD.

For Black:

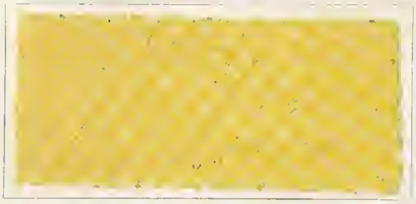
Diamine Black BH, RMW

in combination with

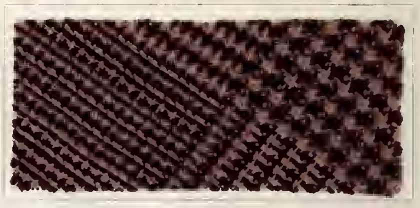
Diamine Fast Yellow A
Diamine Orange G

if required diazotised and developed with Beta Naphtol.

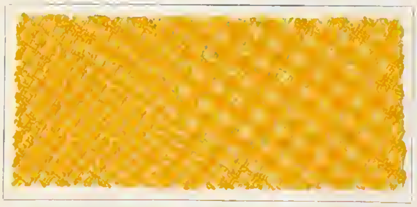
Dyestuffs suitable for dyeing in a cold bath.



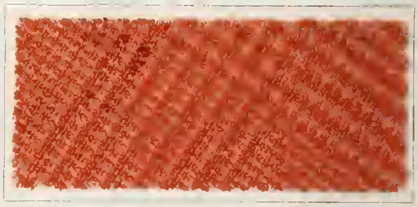
Oxy Diamine Yellow TZ



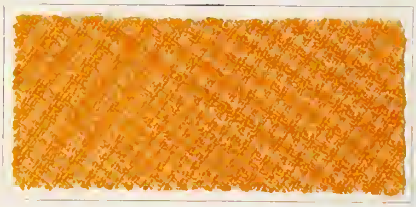
Diamine Brown S



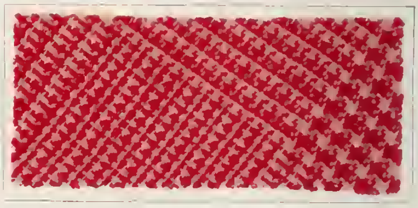
Diamine Fast Yellow A



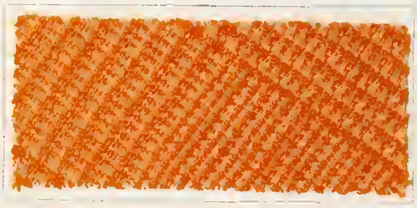
Cotton Red A



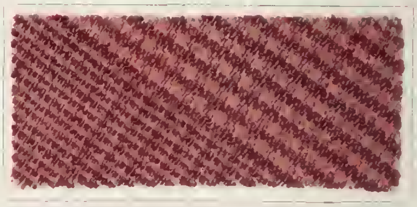
Diamine Orange G



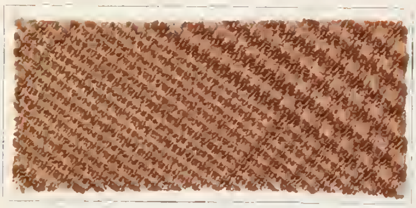
Oxy Diamine Red S



Diamine Orange D



Diamine Red 10 B

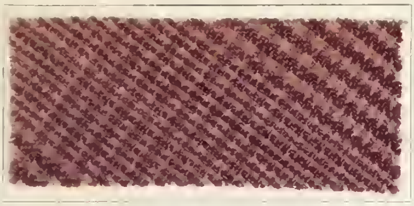


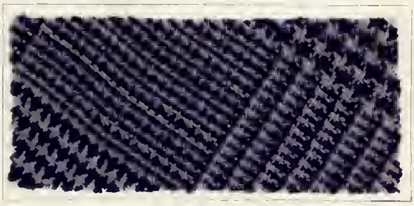
Diamine Nitrazol Brown G

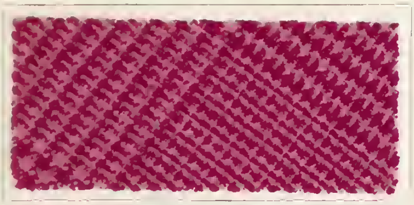
Diamine Purpurine 6 B

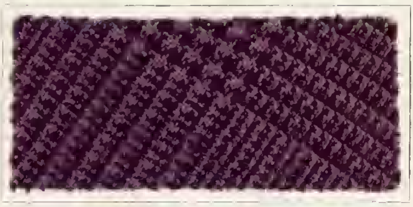
Dyed for $^{3}/_{4}$ hour in a cold bath with $2^{1}/_{4}$ oz dyestuff per 10 gallons liquor.

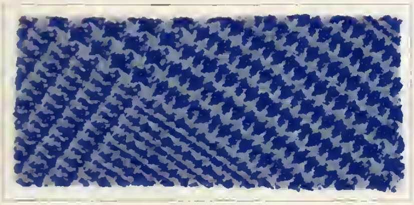
Dyestuffs suitable for dyeing in a cold bath.

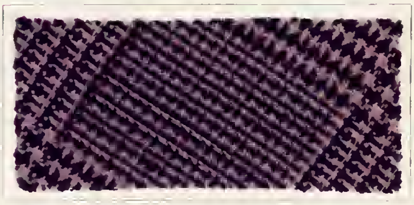

Diamine Violet Red

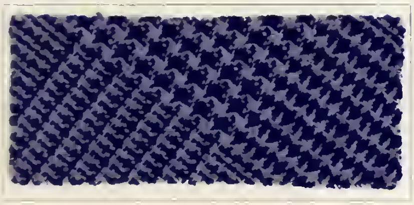

Diamine Black BH

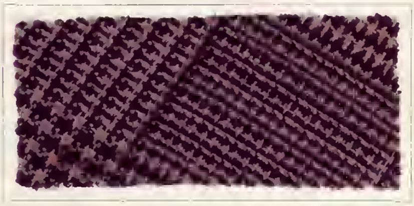

Diamine Rose BD

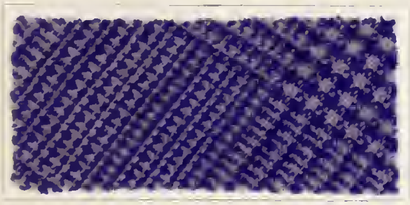

Oxy Diamine Violet B


Diamine Sky Blue FF


Diamine Heliotrope B


Diamine Blue BB


Diamine Heliotrope G


Diamine Brilliant Blue G

Diamine Black RMW

Dyed for $^{3}/_{4}$ hour in a cold bath with $2^{1}/_{4}$ oz dyestuff per 10 gallons liquor.

B. Dyeing the cotton first and the wool subsequently.

By this method the cotton is first dyed black, dark blue or grey fast to acids, the wool being then cross-dyed to the desired shade in an acid bath.

The various methods employed are the following:

1. Previous dyeing of the cotton with black direct colours

(in the jigger or in the dye-vat).

For black, dark blue, dark brown and dark green the following are best suited:

Para Diamine Black B, BB and
Oxy Diamine Black US, SA
if necessary shaded with
Diamine Fast Yellow A.

The concentrated bath is charged at a temperature of 50—60° C. (120—140 deg. F.) with about

6 %	Para Diamine Black B or BB, Oxy Diamine Black US or SA	
0,15 %	Diamine Fast Yellow A	
2 lbs	cryst. Glauber's salt	per 10 gallons liquor;
1½ oz	soda ash	

the goods are entered and dyed for ¾—1 hour, then rinsed, and cross-dyed in the usual manner in an acid bath.

2. Previous dyeing of the cotton with diazotised and developed blacks or blues

(in the jigger or in the dye-vat).

For the production of colours fast to light and washing on linings (italians, serges) and ladies' dress materials (jacquard fabrics, cashmere, orléans etc.), the dyeing may frequently be carried out according to the two-bath method by first cotton-dyeing with suitable dyestuffs in a jigger or in a vat, thereupon diazotising and developing, and finally cross-dyeing the wool in an acid bath.

Black, for instance, is dyed with

5—6 % Diamine Black BH or Diamine Azo Black B (for the starting bath) with the addition of

$\left.\begin{array}{ll} 2\text{ lbs} & \text{cryst. Glauber's salt and} \\ ^{3}/_{8}\text{ oz} & \text{soda ash} \end{array}\right\}$ per 10 gallons liquor

for about 1 hour at 50—60° C. (120—140 deg. F.).

The goods are then rinsed in a cold bath, diazotised in a fresh, cold bath with

3 % nitrite of soda and
9 % hydrochloric acid

for $^{1}/_{4}$ hour, rinsed again in cold water acidulated with hydrochloric acid, and developed in a fresh, cold bath with

0,75 % Phenylene Diamine dissolved with the addition of
2 % soda ash

for $^{1}/_{4}$ hour, then rinsed once more, and wool-dyed in an acid bath.

For *blues and navies,* the following dyestuffs are best adapted for working according to the diazotising process:

Diamine Black BH
Diaminogene Blue NB, NA, 3RN
Diamine Azo Blue 2R,

which are diazotised after dyeing, as described above for black, and then developed with

1 % Beta Naphtol

dissolved with the addition of double its weight of caustic soda lye of 77° Tw.

3. Dyeing the cotton in the milling process.

The cotton in union goods may be dyed in the milling already without any special procedure by adding the dyestuff solution to the milling liquor (which is best prepared with pure soap) and milling the goods in the ordinary manner.

The products best adapted for this method are:

Diamine Milling Black B conc. and FG conc.

(1—1½ % of the weight of the goods), a little Diamine Fast Yellow A being if necessary added for shading.

After milling, the goods are rinsed in the usual manner and then cross-dyed.

For *cross-dyeing,* any of our acid colours suitable for piece-dyeing may be used, as for instance:

For Black and Dark Blue:

Naphtylamine Black S, 4BS, ESN, ES3B, etc.
Naphtol Black B, 3B, 6B
Naphtyl Blue Black N (without sulphate of copper)
Azo Wool Blue SE
Azo Navy Blue B, 3B
Acid Navy Blue A

and for shading:

Formyl Violet (all brands).

For weighted blacks, Naphtyl Blue Black is to be recommended in combination with sumac extract, sulphate of iron and sulphate of copper (see particulars for the dyeing of cashmere on page 68).

For Dark Brown and Dark Green:

Combinations of

Cyanole Green B, 6G
Lanafuchsine SG, SB
Orange extra
Acid Yellow AT.

Before entering the goods, charge the bath with the *whole* quantity of bisulphate of soda or acid necessary for exhausting the liquor; then enter the goods into the lukewarm bath, raise gradually to the boil, and boil until the liquor is exhausted. The bath must always show a distinct acid reaction.

The Production of "Sulphured" or "Stoved" Dyeings.

Very pale, bright shades are produced on flannelettes, astrachan and lambskin imitations, and sometimes also on yarns, by either dyeing in a weak Glauber's salt and soap bath, or to still better advantage with the addition of soap only, the dyeings being then subjected to the action of gaseous sulphurous acid (by stoving in a sulphur chamber).

According to the desired shade, the dyeing is carried out either with the addition of

3—8 oz Glauber's salt and } per 10 gallons liquor
3—8 „ soap }

or of only

3—8 oz soap

for ½—¾ hour in a moderately warm bath of 50—60° C. (120—140° F.); the goods are then whizzed well and evenly, and hung for a few hours (best over-night) in the stoving-box: after stoving, the goods are dried by hanging in an airy place to remove the smell of sulphurous acid.

In order to obtain the brightest shades possible, it is very important to use perfectly clean white goods.

Suitable dyestuffs, for instance, are:

For Cream:

Diamine Gold
Diamine Yellow CP

in combination with

Indian Yellow G, FF;

or,

Diamine Orange F
Oxy Diamine Orange G
Diamine Orange D, G

in combination with

Indian Yellow G, FF
Rosazeïne 13
Irisamine G.

For Yellow:

Thioflavine S
Diamine Yellow CP

in combination if necessary with

Thioflavine T.

For Pink:

Diamine Rose GD, BD
Direct Rose T

in combination with

Rosazeïne 13
Irisamine G
Safranine
Tannin Heliotrope
Erythrosine.

For Violet:

Diamine Violet N alone, or

in combination with

Methyl Violet.

For Pale Blue and Pale Green:

Diamine Sky Blue FF

in combination with

Formyl Blue B
Brilliant Milling Blue B
Victoria Blue B;

or,

Diamine Sky Blue FF
Thioflavine S

in combination with

Brilliant Milling Green B
Brilliant Green crystals extra.

Methods of Stripping Dark Shoddy Materials.

Pale shades are always dyed on light-coloured material as far as is practicable, dark shoddy being used chiefly for deep shades. Such a selection is however not always possible, and dark material sometimes has to be used for dyeing comparatively pale shades; in such a case it will be necessary to strip the material, either wholly or partially as the case demands.

For this purpose, either

sulphuric acid by itself,
or bichromate of potash and sulphuric acid or oxalic acid,
or Hyraldite A

are used, according to the colour and the quality of the goods to be stripped.

Of sulphuric acid, 5—10% of the weight of the goods are used, according to requirement, the material being treated for ½—¾ hour at the boil, and then rinsed thoroughly.

A more thorough stripping may be effected by treating with

3— 6% bichromate of potash and
6—12% sulphuric acid, to which
3— 6% oxalic acid are to advantage added,

the goods being boiled for about one hour and then rinsed.

In either case the goods must be very thoroughly rinsed after stripping and, in the case of the one-dip process, neutralised with a little soda or ammonia, as the wool is otherwise apt to assume too deep a shade. It is advisable to start dyeing below boiling temperature in this case, because the stripped wool absorbs the dyestuff rather too freely.

On the whole the results obtained by stripping with bichromate of potash and sulphuric acid are satisfactory for ordinary purposes; if however the material is not sufficiently decolourised by these methods, or if the yellowish ground obtained cannot be sufficiently decolourised by a subsequent treatment with bisulphite to permit of the desired shade being produced on the material, our *Hyraldite* is to be recommended as an excellent stripping agent.

The material is not in the least affected by the Hyraldite, and in the majority of cases a thorough decolourisation is effected such as is not attainable with any other stripping agent.

The stripping with Hyraldite is best carried out in a clean wooden vessel.

Prepare a warm bath charged

for light-coloured goods with

3—5 % Hyraldite A (dissolved in hot water), to which add
3—5 % acetic acid or bisulphite of 77° Tw. shortly before entering the material,

for dark shoddy goods with

6—10 % Hyraldite A and
6—10 % acetic acid or bisulphite of 77° Tw.;

enter the goods, raise gradually (in the course of 30—40 minutes) to the boil, and boil for 20 minutes.

Thereupon rinse well first in cold and then in warm water, and if necessary neutralise thoroughly with soda or ammonia.

B.

Special Part.

Gentlemen's Suitings (Worsteds and Cheviots).
Overcoatings (Meltons, Presidents, Astrachans, etc.).
Ladies' Dress Materials.
    a) Ladies' Cloths, Twills and Jacquard Fabrics.
    b) Jacquard Fabrics with Mercerised Cotton.
    c) Union Cashmere Goods.
    d) Union Lustre and Alpaca Goods.
    e) Union Crepons.
    f) Shot Effects.
Union Linings (Italians and Serges).
Flanelettes and Lambskin Imitations.
Union Hosiery and Union Felts.
Shoddy Goods containing a Cotton Warp.
Burl Dyeing.
Union Braids.
Union Yarns (Angola Yarns).
Shoddy, Pulled Rags, Waste, etc.
Dyeing Union Goods containing Silk.

Gentlemen's Suitings.

(Worsteds and Cheviots.)

Goods of this kind are usually manufactured from a white worsted or cheviot warp and a shoddy weft sometimes containing a large percentage of cotton; cheviot goods are frequently also made from a cotton warp and shoddy weft.

Owing to the simple and easy method of application, Diamine Colours are used most extensively for dyeing goods of this kind.

These goods are usually dyed in medium and dark shades. The process is very simple if the cotton is hidden by the wool, all that is then necessary being to dye the cotton a little deeper than the wool. If, however, the cotton appears in the design on the surface of the goods, it must be dyed the same shade as the wool, but slightly darker than the latter.

For gentlemen's suitings, especially cheviots, woollen material of such a dark colour is frequently used that a great many shades, especially bright ones, can only be dyed thereon after stripping the old colour. (For details of stripping see page 51.)

The goods are almost exclusively dyed according to the one-dip process; for instance:

Black on low-class goods is dyed with the various Oxy Diamine Blacks, such as

Oxy Diamine Black A, D
Oxy Diamine Black FFC
Oxy Diamine Black SA
Oxy Diamine Black JE, JEI, JB, JW, JWF
or with
Para Diamine Black B, BB

in combination with

Naphtylamine Black 4B, 6B, X3B etc.

For dyeings fast to light

Diamine Fast Black F
is used in combination with
Naphtylamine Black 4B, 6B, X3B etc.
Neutral Wool Black B, G
or,
Union Fast Black J in combination with
Union Black S, P, BG, 2B, 3B,

if necessary together with violet or blue wool dyestuffs.

Cheap Navies are produced with

Oxy Diamine Black A or JWF
in combination with
Oxy Diamine Blue (all brands)
Diamineral Blue R, CV
Formyl Violet (all brands)
Formyl Blue B;

and in *better fastness to light* with

Union Black S
Diamine Dark Blue B
Diamine Black BH
Lanacyl Blue BB, R
Lanacyl Navy Blue B, BB
shaded with
Diamine Heliotrope B
Naphtol Blue Black
Brilliant Milling Green B
Formyl Violet (all brands)
Formyl Blue B.

Browns and Olives is dyed with the various brands of

Diamine Brown
Oxy Diamine Brown and
Diamine Catechine G, 3G
saddened with
Union Black S
Diamine Black HW or
Oxy Diamine Black A, JW

and shaded with
- Diamine Fast Yellow B
- Diamine Yellow CP
- Diamine Red 4B
- Indian Yellow G
- Orange extra
- Naphtol Blue Black
- Brilliant Milling Green B.

Dark Greens and Russian Greens are produced with

- Diamine Green B, CL
- Diamine Dark Green N
- Diamine Black HW
- Oxy Diamine Black JEI

shaded with
  - Brilliant Milling Green B
  - Naphtol Blue Black
  - Orange extra
  - Indian Yellow.

For Mode Colours and Greys the following Diamine Colours are employed:

- Diamine Fast Black F
- Union Black S
- Diaminogene B, extra
- Diamine Fast Blue FFB
- Diamine Catechine B
- Diamine Orange B
- Diamine Fast Yellow B, FF, M
- Diamine Bordeaux B

shaded with
  - Lanacyl Blue BB, R
  - Lanacyl Navy Blue B
  - Naphtol Blue Black
  - Orange extra
  - Indian Yellow G
  - Azo Red A.

Besides the one-dip process, the two-bath method as described on page 39 is in some cases also employed if the colours obtained by the former are not bright or level enough.

Union Worsteds.	Union Cheviots.
1 0,04 % Lanacyl Blue BB 0,25 % Diamine Catechine B 0,07 % Orange ENZ 0,09 % Diamine Fast Yellow B 0,06 % Diamine Orange B.	6 0,3 % Diamine Black BH 0,25 % Formyl Blue B 0,03 % Indian Yellow G 0,15 % Orange ENZ.
2 1 % Diamine Fast Black F 0,5 % Lanacyl Blue BB 1,5 % Diamine Catechine B 0,5 % Diamine Orange B 0,15 % Orange ENZ.	7 1,25 % Oxy Diamine Black JWF 0,7 % Oxy Diamine Orange R.
3 1,4 % Diaminogene B 0,4 % Lanacyl Blue BB 0,7 % Indian Yellow G 2,2 % Diamineral Brown G 0,5 % Diamine Fast Yellow B.	8 2 % Oxy Diamine Black JWF 2 % Diamine Brown 30a 0,7 % Indian Yellow G.
4 1,2 % Diamine Fast Black F 0,5 % Lanacyl Navy Blue B 0,3 % Diamine Catechine 3G 0,11 % Diamine Heliotrope B 0,1 % Orange ENZ.	9 2,5 % Oxy Diamine Black JWF 0,8 % Naphtylamine Black 4B 1,5 % Formyl Violet 4B.
5 2,25 % Diaminogene B 0,6 % Lanacyl Blue BB 0,2 % Formyl Blue B 0,1 % Diamine Fast Yellow B 0,15 % Naphtol Blue Black.	10 5 % Oxy Diamine Black JWF.

Dyed according to the one-dip process.

Union Worsteds.

1

2

3

4

5

Union Cheviots.

6

7

8

9

10

Overcoatings.

(Meltons, Presidents, Astrachans, etc.)

Just as in the case of the goods mentioned in the previous pages the Diamine Colours have become of great importance for the dyeing of overcoatings, union meltons, etc. With very few exceptions these goods are also dyed according to the one-dip process. For pale modes and drabs, as well as for bright blue and red shades, white material is used if possible, whereas deep shades of blue, brown, green and black are usually dyed on pieces manufactured from coloured or dark material.

For deep shades of this kind and for mode colours the dyestuff combinations already indicated for worsteds and cheviot goods are employed.

Bright Blues are obtained with

- Union Blue RJ
- Oxy Diamine Blue G, 3G, 5G
- Diamine Blue 2B, 3B
- Diamine Brilliant Blue G
- Diamineral Blue CV
- Diamine Sky Blue FF
  - shaded with
    - Lanacyl Blue BB, R
    - Formyl Blue B
    - Brilliant Milling Blue B
    - Alkaline Blue;

Bright Reds are dyed with

- Diamine Red (all brands)
- Diamine Purpurine (all brands)
- Diamine Scarlet (all brands)
  - shaded if necessary with
    - Rosazeïne
    - Irisamine.

If the wool face of meltons and presidents contains carbonised wools which tend to yield mottled dyeings, it is recommended to work the goods in hot water charged with some ammonia before dyeing and to then rinse them again.

With some kinds of goods which contain mixtures of different kinds of wool, on which the one-dip process would not yield sufficiently level results, the two-bath method is employed by previously wool-dyeing with acid colours and covering the cotton subsequently in a cold or lukewarm bath with Diamine Colours.

For this purpose the dyestuffs mentioned in Group II and especially those enumerated on page 39 for the two-bath method are best suited.

Further details for dyeing according to the one-dip or two-bath method are given in our card No. 2475, "Mode Shades on Union Meltons".

The dyeing of *astrachans* is very simple, as the shade of the wool and the cotton in most cases need not be exactly uniform and the cotton has to be a little darker only than the wool. A very hard wool which easily absorbs the colours being ordinarily used for this kind of goods, it is advisable to dye slowly and at not too high a temperature.

It is best to enter the goods into a lukewarm bath and to gradually raise the temperature until the wool has assumed the desired shade, which is in most cases attained below boiling point already.

Of the Diamine Colours, those enumerated in Group II as dyeing the cotton deeper than the wool are employed.

For bright shades which cannot be produced with Diamine and Wool Colours alone, a topping in a fresh bath with Basic Colours is resorted to.

The following come chiefly into consideration for this purpose:

Magenta Ia. Dia. small crystals
Methyl Violet
Victoria Blue.

Enter cold with the addition of 3—5 % acetic acid, and heat gradually, for Magenta to 40—50° C. (105—120 deg. F.) and for Methyl Violet and Victoria Blue to boiling.

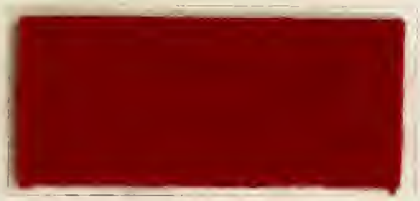
Union Meltons.	Union Astrachans.
1 0,03 % Diaminogene B 0,03 % Lanacyl Blue R 0,012 % Diamine Orange B 0,04 % Diamine Catechine B.	6 0,8 % Union Black S 0,25 % Lanacyl Navy Blue B 0,14 % Diamine Catechine B.
2 2 % Diamine Scarlet B 0,3 % Diamine Red 4B.	7 1,5 % Diamineral Brown G 1 % Oxy Diamine Brown RN 0,5 % Indian Yellow G 0,5 % Union Black S.
3 0,6 % Oxy Diamine Blue 3G 1 % Diamine Black BH 1,25 % Lanacyl Blue BB 2,25 % Formyl Blue B	8 1,75 % Union Black S 2 % Diamine Black BH 1,5 % Lanacyl Navy Blue B 0,8 % Formyl Violet 10B.
4 1,8 % Diamine Dark Green N 0,6 % Oxy Diamine Black JEI extra conc.	9 1 % Diamine Brown M 0,25 % Diamine Black BH 0,25 % Lanacyl Navy Blue B 2 % Diamine Bordeaux B.
5 0,9 % Diaminogene B 0,19 % Lanacyl Blue R 1 % Diamine Fast Yellow B 0,66 % Indian Yellow G 2,3 % Diamineral Brown G.	10 0,75 % Diamine Violet N for $^3/_4$ hour at 80 °C. (175 °F.) 1 % Magenta Ia. Dia. small crystals.

Dyed according to the one-dip process.
No. 10 is topped in a fresh bath with Magenta Ia. Dia. small crystals.

Union Meltons.

1

2



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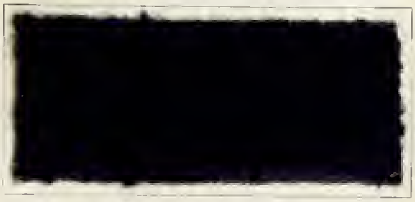
Union Astrachans.

6



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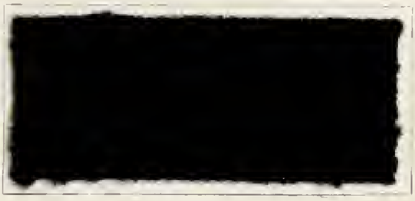

9

10

Ladies' Dress Goods.

a) Cloths, Twills and Jacquard Fabrics.

Goods of this kind are nearly always dyed with Diamine Colours according to the one-dip process, which offers very considerable advantages as compared with the old method of dyeing with sumac and iron. Working with Diamine Colours is for instance much simpler and quicker, a saving in time and wages being thus effected; such dyeings are besides noted for a good fastness to alkalies and consequently also to street dirt.

The fastness to rubbing of such dyeings is very good, which is especially noticeable in dark shades; another advantage is thus offered over dyeings produced according to the old process with sumac and iron and basic dyestuffs.

Especially for ladies' cloth the soft woolly feel obtained by the application of the Diamine Colours is of great importance for improving the quality of the goods.

The following dyestuffs are generally used for styles required to be *very fast to light:*

Diamine Fast Yellow A, B, FF, M
Diamine Yellow CP
Diamine Orange B
Diamine Fast Red F
Diamine Bordeaux B
Diamine Violet N
Diamine Fast Blue FFB, FFG, G
Diaminogene B and extra
Diamine Black BH
Diamine Fast Black F
Diamine Catechine B
Diamine Brown M, B, 3G
Diamineral Brown G
Lanacyl Blue BB, R
Naphtol Blue Black
Lanacyl Navy Blue B, BB
Orange extra
Croceïne AZ.

For cheap goods, combinations such as are mentioned for union worsteds and cheviots are used.

b) Jacquard Fabrics containing Mercerised Cotton.

Very good imitations of wool and silk or mohair styles are obtained if in place of an ordinary cotton warp for ladies' dress goods, mercerised cotton is used.

Such goods are likewise dyed according to the one-dip process; the dyeing operation however differs from that followed for other union goods in so far as the cotton is kept a lighter shade than the wool in order to render the effects more prominent. Since, on the other hand, the cotton by mercerising acquires a much greater affinity for colouring matters, such dyestuffs are chiefly employed as dye the wool deepest (Groups I and III) or those of Group II in combination with suitable wool colours.

Contrary to the ordinary directions, severe and continuous boiling is usually resorted to.

In some instances the absorption of the colouring matters by the wool may be assisted by the addition of slight quantities of acetic acid. In order to retain the lustre of the cotton, the dyeing is carried out as rapidly as possible, and some acetic acid is added to the rinsing bath.

For mode shades fast to light, the dyestuffs enumerated on the foregoing page for ladies' cloth are specially well suited, and for red and claret, Diamine Red and Diamine Purpurine (all brands), Diamine Scarlet B, 3B, Diamine Bordeaux B, S, VRO or Oxy Diamine Violet B, R, whereas the combinations of Diamine Colours and supplementary wool colours mentioned on pages 55—57 for the dyeing of worsteds serve for the production of the other shades.

As a *black fast to light,*

Union Fast Black J
shaded with
Diamine Black BH or
Diamine Fast Blue FFB

is especially suitable.

For further details see our special pattern card No. 1987.

Ladies' Union Cloth.	Ladies' Cloth containing Mercerised Cotton Effects.
1	6
0,25 % Diaminogene B 0,15 % Diamine Catechine B 0,2 % Diamine Orange B 0,03 % Lanacyl Blue BB 0,015 % Diamine Brown 30a.	0,025 % Diamine Fast Blue FFG 0,03 % Diamine Fast Yellow B 0,04 % Diamine Catechine B 0,06 % Lanacyl Blue BB 0,005 % Indian Yellow G.
2	7
0,45 % Diamine Fast Blue FFB 0,18 % Formyl Blue B 0,03 % Diamine Catechine B.	0,3 % Diamine Red 10B.
3	8
0,5 % Diaminogene B 0,2 % Lanacyl Blue BB 3 % Diamine Brown 37.	0,5 % Diamine Fast Blue FFG 1,8 % Diamine Fast Blue FFB 1,5 % Lanacyl Blue BB 1,5 % Lanacyl Blue R.
4	9
2,75 % Diamine Black HW 0,75 % Naphtol Blue Black 0,3 % Diamine Fast Yellow A 0,25 % Indian Yellow G.	1,5 % Diamine Red 4B 2 % Diamine Brown R 0,75 % Diaminogene extra.
5	10
3 % Diamine Violet Red 0,5 % Diamine Heliotrope B 0,6 % Diamine Orange D.	6 % Union Fast Black J 0,75 % Diamine Fast Blue G.

No. 1–5 dyed according to the one-dip process.
No. 6–10 see particulars for this style.

Ladies' Union Cloth.

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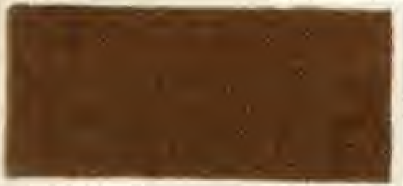

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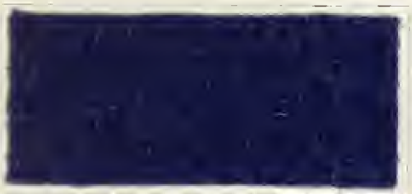

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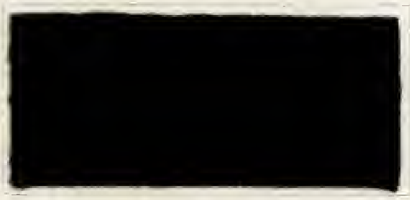

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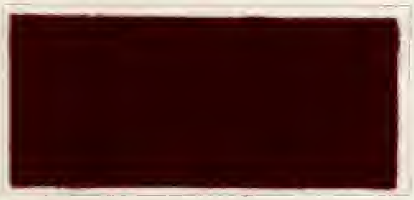

Ladies' Cloth containing Mercerised Cotton Effects.

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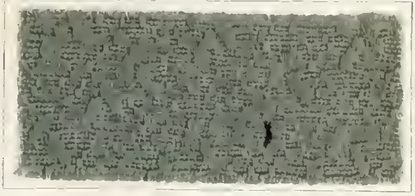

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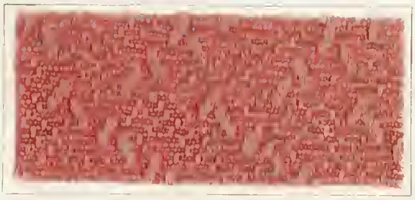

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c) Union Cashmere Goods.

Union cashmere and similar goods containing soft worsted yarns are mostly dyed according to the one-dip process in dark shades only, especially black, whereas for light shades the wool is first dyed in an acid bath with acid colours and the cotton covered subsequently with Diamine Colours.

Dark shades like *black, dark blue, dark brown and dark green* are also frequently produced according to the two-bath method, by first cotton-dyeing with a black fast to acids, such as Para Diamine Black or Oxy Diamine Black US, and cross-dyeing in an acid bath.

Full details for these two different ways of applying the two-bath method will be found on page 39.

For particulars of the one-dip process see page 35.

Black cashmere goods are frequently required to show an increased weight after the dyeing process, which can be attained by working according to the following recipe:

The goods are cotton-dyed with a direct dyeing black fast to acids (Para Diamine Black, Oxy Diamine Black US, as stated on page 46), or with diazotised blacks (page 46).

For cross-dyeing charge the bath with

$2^1/_2$ — 3 $^0/_0$	oxalic acid,
2 — $2^1/_2$ $^0/_0$	Naphtyl Blue Black N,
1 $^0/_0$	Naphtol Blue Black,
7 —10 $^0/_0$	sumac extract,
10 $^0/_0$	Glauber's salt and a little Formyl Violet S4B or Formyl Blue B according to requirement;

enter the goods into the hot bath, then raise the temperature to the boil, and boil for about 1 hour; thereupon add

1—2 $^0/_0$	sulphate of copper and
2—4 $^0/_0$	sulphate of iron,

boil for another $^1/_2$ hour, and rinse thoroughly.

When dyeing consecutive lots, any precipitate which may have formed is first dissolved by adding a little oxalic acid; then the Glauber's salt and the dyestuff along with 5—8% extract of sumac are added, dyeing being continued as stated for the first lot.

d) Union Lustre and Alpaca Goods.

Thin light lustre goods are dyed either according to the one-dip process or by first dyeing the wool in an acid bath and subsequently dyeing the cotton with Diamine Colours; in both cases dyeings result of excellent fastness to rubbing and alkalies.

Very tightly woven alpaca goods containing a hard twisted warp, intended for moiré styles which are difficult to penetrate, are dyed with Diamine Colours, which is best done with the addition of 5—10% borax.

In order to prevent creases lengthways, dyeing in the jigger is resorted to, starting in a bath heated to 50—60° C. (120—140 deg. F.) and charged only with the necessary dyestuff and 8—10% borax. If after 4 to 6 passages the warp is sufficiently dyed through, Glauber's salt is added and the temperature raised gradually until the wool also has assumed a sufficient depth of shade.

For pale shades it is sufficient to add ½—1 lb cryst. Glauber's salt per 10 gallons liquor at a temperature of about 60° C. (140 deg. F.); for medium and dark shades 2—4 lbs cryst. Glauber's salt per 10 gallons liquor are added, the temperature being raised to 80—90° C. (175—195 deg. F.)

Union Cashmere.	Union Alpaca.
1 0,1 % Cyanole Fast Green G 0,13 % Lanafuchsine SB 0,1 % Acid Yellow AT 1¼ drs Diamine Orange D 1½ „ Diamine Fast Yellow B 2 „ Diamine Black RMW ¼ „ Diamine Sky Blue FF per 10 gallons liquor.	6 0,05 % Diamine Rose GD 0,03 % Irisamine G.
2 0,2 % Cyanole Fast Green G 0,15 % Lanafuchsine SB 0,05 % Acid Yellow AT 1 drs Diamine Orange D 3 „ Diamine Sky Blue FF 2¼ „ Diamine Nitrazol Brown G per 10 gallons liquor.	7 1 % Diamine Sky Blue FF 1,5 % Diamine Blue BB 0,7 % Alkaline Blue B.
3 2 % Naphtol Red C 4 oz Diamine Red 10B per 10 gallons liquor.	8 0,25 % Diaminogene B 2 % Diamine Brown R 0,4 % Oxy Diamine Brown RN.
4 3 % Azo Wool Blue SE 2 oz Diamine Black BH per 10 gallons liquor.	9 2,25 % Cyanole Fast Green G 0,5 % Acid Yellow AT 0,2 % Orange extra 3½ oz Diamine Green G per 10 gallons liquor.
5 5,5 % Oxy Diamine Black US 0,2 % Diamine Fast Yellow A 3,5 % Azo Merino Black 6B.	10 0,39 % Lanafuchsine SB 0,15 % Formyl Violet S4B 2½ oz Diamine Heliotrope B per 10 gallons liquor.

Nos 1—4, 9 and 10 were dyed according to the two-bath process by wool-dyeing first in an acid bath and then cotton-dyeing, No 5 by cotton-dyeing first and subsequently cross-dyeing the wool, and Nos 6—8 according to the one-dip process.

Union Cashmere.

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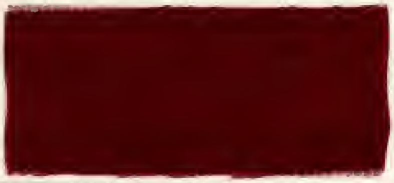

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Union Alpaca.

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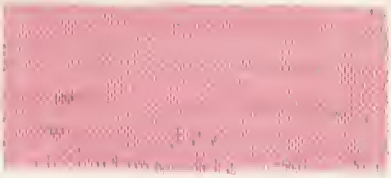

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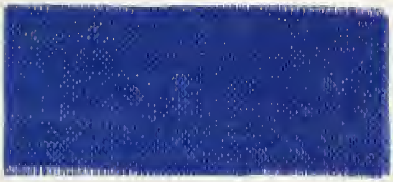

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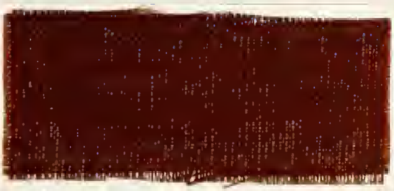

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e) Union Crepon Goods.

Crepon effects on unions are produced by mercerising the goods with caustic soda lye.

This may be done either in a small box supplied with guiding and squeezing rollers and containing caustic soda lye of about 22—32 degrees, or by passing the goods through a padding machine the trough of which is charged with caustic soda lye of about 52 degrees Twaddle. In both instances means should be provided for cooling the lye to 5—8° C. (41—48 deg. F.)

According to the concentration of the lye and the size of the roller box, such a passage should last about 1 to 3 minutes; when using a weaker lye, the goods must be acted upon longer than when using a stronger, more concentrated lye.

The goods are squeezed off well, but not rinsed, and then immediately run into a cold bath charged with 1—2 lbs hydrochloric or sulphuric acid per 10 gallons liquor. After being well worked in this liquor they are rinsed repeatedly, and neutralised if necessary with ammonia. The acid bath must still show a distinct acid reaction after lifting the goods.

The mercerising is done mostly before the dyeing, but it may also be carried out subsequently if desirable for manufacturing reasons, especially in the case of black or other staple shades produced in large quantities; in the latter case it is important to work very rapidly, sour off and rinse thoroughly, neutralising if necessary with ammonia. The following Diamine Colours withstand the mercerising process fairly well and are therefore best suited for this purpose:

Thioflavine S
Diamine Gold
Diamine Fast Yellow A
Diamine Fast Yellow B, FF
Diamine Orange G, D
Diamine Rose BD
Diamine Scarlet B
Diamine Brilliant Scarlet S
Diamine Red 5B
Diamine Purpurine B, 6B
Diamine Fast Red F
Diamine Bordeaux B
Diamine Violet N
Diamine Heliotrope B
Diamine Sky Blue, FF
Diamine Brilliant Blue G
Diamineral Blue R, CV
Diamine Dark Blue B

Diamine Steel Blue L
Diamine Green G, B
Diamine Dark Green N
Diamine Brown M, 3G
Diamine Catechine B, G
Diamine Bronze G
Oxy Diamine Brown G, 3GN, RN
Diamine Black RO, BH, HW
Oxy Diamine Black BM
Oxy Diamine Black JE, JEI, JW, JB
Oxy Diamine Black D
Union Black S, BG
Diaminogene extra.

The wool colours best withstanding the mercerising process and which are also well suited for producing two-coloured effects either in an acid bath or in a neutral bath (for shading purposes) are the following:

*Naphtol Yellow S
Indian Yellow G, FF
Orange ENZ
Tropaeoline 00
Crystal Scarlet 6R
*Brilliant Cochineal 2R
Rosazeïne B, 13
Eosine GGF
*Lanafuchsine SG
Azo Rubine A
*Brilliant Orseille C
*Azo Wool Violet 7R
Formyl Violet S4B
Formyl Violet 10B
*Cyanole extra
*Indigo Blue N
Brilliant Milling Blue B
*Fast Acid Green BN
*Cyanole Fast Green G
Brilliant Milling Green B
Lanacyl Blue BB
Lanacyl Violet B
Lanacyl Navy Blue B
*Naphtol Black 2B
Naphtylamine Black 4B
*Naphtylamine Black S.

Previously mercerised goods are dyed in a neutral bath exactly like ordinary union goods; the quantity of Glauber's salt may however be reduced by one-half, 1 lb per 10 gallons liquor proving sufficient.

The boiling should be prolonged somewhat, because the cotton absorbs the Diamine Colours more rapidly than the wool.

For two-coloured or shot effects, the wool is first dyed with the addition of 10 % bisulphate of soda, the cotton being then covered in a short fresh bath of 30° C. (85 deg. F.) with the addition of 2 lbs Glauber's salt and $^3/_4$ oz soda per 10 gallons liquor.

(Continued on page 76.)

The dyestuffs marked with an asterisk (*) can only be dyed in an acid bath.

Union Crepon Goods.

1

0,33 % Diaminogene extra
0,1 % Diamine Catechine B
0,05 % Formyl Blue B.

2

0,2 % Diaminogene B
0,2 % Diaminogene extra
0,33 % Diamine Orange B
0,16 % Diamine Orange D
0,25 % Diamine Fast Yellow B.

3

2,65 % Diamine Steel Blue L
1 % Diamineral Blue R
0,25 % Formyl Blue B.

4

1 % Diamine Bordeaux B
0,25 % Diaminogene B
2 % Diamine Brown R.

5

3 % Diamine Violet Red
2 % Diamine Bordeaux B
0,25 % Diamine Orange D.

6

1,5 % Diamine Fast Blue FFB
0,7 % Lanacyl Blue BB
0,5 % Formyl Violet 10B
0,85 % Formyl Blue B.

7

1,5 % Diamine Steel Blue L
1,35 % Diamine Black HW.

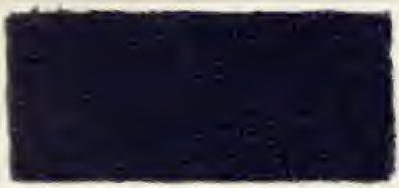
8

3 % Union Black S
1,65 % Naphtylamine Black BBN.

Dyed according to the one-dip process.

Union Crepon Goods.

1



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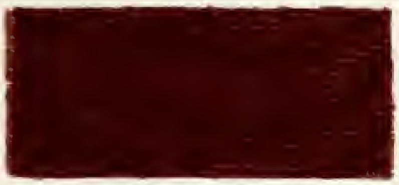

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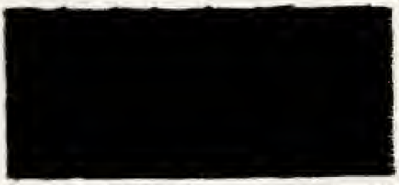

The black ground colour on cotton for shot effects, however, is usually produced by the diazotising process. The cotton is dyed at 40° C. (105 deg. F.) in a bath charged with 2 lbs Glauber's salt and $1^1/_2$ oz soda per 10 gallons liquor. After rinsing, the diazotising and developing is carried out in the customary manner, and the wool is then cross-dyed in an acid bath.

Goods which are to be mercerised *after* dyeing are dyed in the usual way with 2 lbs Glauber's salt per 10 gallons liquor, rinsed, thoroughly hydroextracted, and then mercerised.

f) Shot Effects.

Shot effects on union goods are usually produced by first acid-dyeing the wool and then dyeing the cotton with Diamine Colours.

The goods are first wool-dyed in a boiling acid bath, and after rinsing well (to best advantage in a bath containing a slight addition of ammonia or soda), the cotton is dyed in a cold or lukewarm bath with suitable Diamine Colours.

The one-dip process may also be used by first dyeing the wool in a neutral bath with the dyestuffs suitable for this purpose (see page 28), adding the colours necessary for covering the cotton (Group II) after shutting off steam, and running the goods in the cooling off bath. The effects so obtained are however not quite so clear or bright as when working according to the two-bath method, and it is not quite so easy to hit on a certain given effect as by the first-mentioned process.

The following easily levelling colours are best suited for first dyeing the wool in an acid bath (see page 39):

For Mode Shades:

Cyanole Green B, 6G or Tetra Cyanole V
Lanafuchsine SB or Azo Orseille BB
Acid Yellow AT.

For Yellow:

Naphtol Yellow S
Indian Yellow G, FF.
Acid Yellow AT

For Orange:

Tropaeoline 00
Orange extra, II, ENZ.
Orange IV

For Pink and Red:

Rosazeïne B
Scarlet, all brands
Lanafuchsine SG, SB.
Irisamine G
Naphtol Red C, EB

For Claret:

Naphtol Red C, EB　　Azo Wool Violet 7R
shaded with
Orange extra　　Cyanole Green B, 6G.

For Blue:

Cyanole extra
Azo Wool Blue SE
Indigo Blue N, SGN
Azo Navy Blue B, 3B.

For Violet:

Formyl Violet 10B, S4B
Azo Wool Violet 4B.

For Green:

Fast Acid Green BN
Cyanole Fast Green G
Brilliant Milling Green B
Cyanole Green B, 6B.

For Black:

Naphtylamine Black 4B, 6BS etc.
Naphtol Black B, 3B etc.
Azo Merino Black BE, 6BE.

After a thorough rinsing in the manner above described, the goods are cotton-dyed for $^1/_2$—$^3/_4$ hour in a weakly alkaline bath as indicated on page 41, then brightened in water slightly acidulated with acetic acid, or if necessary topped lightly with basic colours.

The cotton dyed with Diamine Colours possesses a much better fastness to rubbing than when dyed with basic colours according to the old method.

Shot Effects (dyed according to the two-bath method).

1 1,25 % Cyanole Fast Green G 0,5 % Acid Yellow AT 3 oz Diamine Purpurine 6B per 10 gallons liquor.	5 1,5 % Brilliant Milling Green B 3 oz Diamine Blue 2B per 10 gallons liquor.
2 1,75 % Croceine AZ 4 oz Diamine Fast Blue FFB per 10 gallons liquor.	6 1,5 % Brilliant Milling Green B 3/4 oz Diamine Purpurine 6B 3 „ Diamine Nitrazol Brown G per 10 gallons liquor.
3 2 % Azo Wool Blue SE 3 oz Diamine Purpurine 6B 1 1/2 „ Diamine Nitrazol Brown G per 10 gallons liquor.	7 1 % Formyl Violet S4B 3/8 oz Diamine Orange D per 10 gallons liquor.
4 3 % Cyanole Fast Green G 0,5 % Acid Yellow AT 3 oz Diamine Heliotrope B per 10 gallons liquor.	8 2,5 % Naphtylamine Black 6B 3/4 oz Diamine Fast Blue FFB per 10 gallons liquor.

The wool was dyed in an acid bath and the cotton covered subsequently in a cold bath.

Shot Effects (dyed according to the two-bath method).

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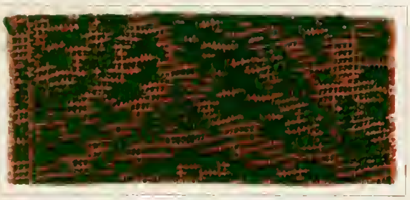

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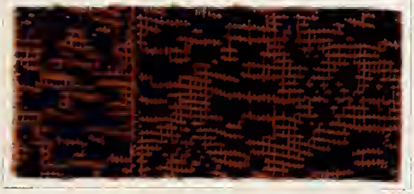

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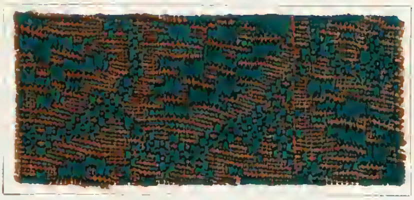

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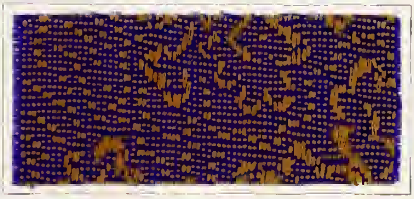

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Union Linings.

(Italians and Serges.)

The most important colour for union linings is black, which is usually dyed by the one-dip process; better-class goods are dyed with

Union Black S or Oxy Diamine Black BM,

and cheap goods with

Oxy Diamine Black A, D, JW, JB, FFC
Para Diamine Black B, BB
Union Black P, BG, BB, 3B, etc.

in conjunction with

Naphtylamine Black 4B, 6B, X2B, etc.
Naphtol Blue Black
Brilliant Milling Green B
Formyl Blue B
Formyl Violet S4B

according to requirement. Like other union fabrics these goods are dyed in a very short bath. It is recommended, especially for *blue-black*, to boil first with Naphtol Blue Black and Formyl Violet for $^1/_2$—$^3/_4$ hour with the addition of Glauber's salt, and, after shutting off steam, to add Union Black S or Oxy Diamine Black BM The goods are for instance boiled for $^1/_2$—$^3/_4$ hour with about

0,60% Naphtol Blue Black,
0,50% Formyl Violet S4B

and 2 lbs cryst. Glauber's salt per 10 gallons liquor; after shutting off steam,

4—5% Oxy Diamine Black BM and
0,25% Diamine Fast Yellow A

are added, and the working is continued for $^3/_4$ hour. If the wool be then still too pale, the bath is again brought to the boil, and kept boiling until the desired depth of shade is attained.

In a similar manner, smaller quantities of Naphtol Blue Black and Formyl Violet and somewhat increased quantities of

Oxy Diamine Black may be used for producing *jet blacks,* or the whole of the quantities of dyestuff required may be added in one portion.

In order to avoid creases, the dyed goods are not wound up on the winch, but are squeezed lightly instead on coming from the liquor and rinsed cold, or immediately aftertreated for $^1/_2$ hour in a bath of 50—60° C. (120—140 deg. F.) containing 3 % bichromate of potash and $^1/_4$—$^1/_2$ % sulphuric acid, which renders the colour more resistant to the subsequent operations such as steaming and crabbing. If the goods are to be merely steamed and not crabbed, a passage through a lukewarm bath charged with 3—5 % alum, reckoned on the weight of the goods, is sufficient.

For a *weighted black with a good feel,* the goods are first cotton-dyed with a black fast to acids (Oxy Diamine Black US, SA, Para Diamine Black B, BB etc.) in a bath of 50—60° C. (120—140 deg. F.), the wool being cross-dyed by the Naphtyl Blue Black N — sumac process (as indicated for cashmere goods on page 68) or with one-dip Logwood black.

Serges which are rather apt to turn out mottled are cooled after dyeing by plating, and are left lying for some hours before rinsing.

For *mode colours* and for all other shades (blue, brown, red etc.) the one-dip process permits of rapid and reliable working as well as considerable saving in time as compared with the old method; the dyeings possess excellent fastness to rubbing and are fast to acids, perspiration etc., which properties are of primary importance for linings.

In some cases the shades obtained by the one-dip process are not quite level and solid; it is then useful also for mode shades to work as indicated for black by first boiling for $^1/_2$—$^3/_4$ hour with the requisite quantities of wool dyestuffs and Glauber's salt only, then adding the Diamine Colours after shutting off steam, and feeding in the cooling bath, or, to work according to the two-bath method (see page 39) by dyeing the wool in an acid bath and covering the cotton with Diamine Colours in a fresh, cold bath.

In this connection see our special card No 2632,"Dyeings on Half-wool Linings (Italians)" which also contains particulars for the production of dyeings possessing special fastness to perspiration.

Union Italians.

1

0,01 % Diamine Fast Blue FFB
0,01 % Diamine Violet N
0,02 % Formyl Violet S4B.

2

0,1 % Diamine Fast Black F
0,1 % Diamine Catechine B
0,1 % Diamine Orange B
0,03 % Diamine Fast Yellow B
0,02 % Naphtol Blue Black.

3

0,3 % Diamine Orange B
0,07 % Diamine Fast Yellow B
0,03 % Naphtol Blue Black
0,1 % Union Black S
0,02 % Diamine Bordeaux B.

4

1,5 % Diamine Fast Black F
1,25 % Diamine Orange B
0,1 % Diamine Brown M
0,15 % Naphtol Blue Black.

5

2 % Diamine Brown M
0,5 % Diamine Red 5B
0,001 % Formyl Violet S4B.

6

0,2 % Diamine Fast Black F
0,25 % Diamine Catechine B
0,1 % Naphtol Blue Black
0,06 % Azo Red A.

7

0,35 % Diamine Fast Blue FFB
0,05 % Formyl Violet S4B
0,1 % Naphtol Blue Black.

8

4,5 % Oxy Diamine Black JW
0,15 % Diamine Fast Yellow A
1,5 % Naphtylamine Black 4B.

Dyed according to the one-dip process.

Union Italians.

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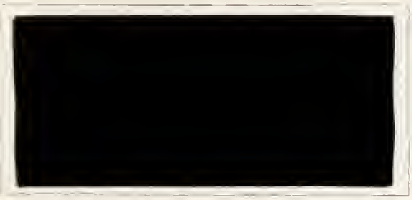

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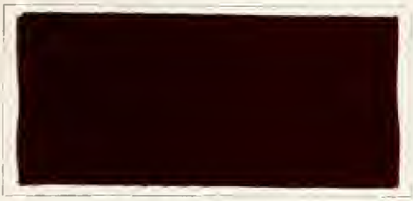

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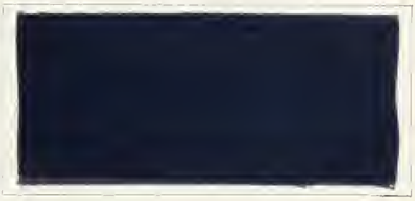

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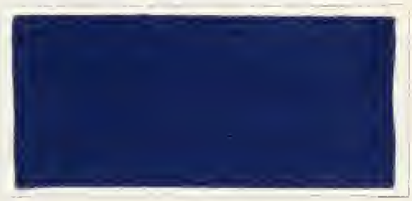

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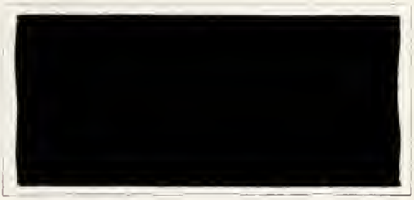

Flannelette and Lambskin Imitations.

The one-dip process is used quite generally for fabrics of this kind, because it permits of rapid and reliable working which is desirable for preserving the material as much as possible and imparts to the goods a soft woolly handle such as cannot be obtained when working according to other methods. The dyeings produced with Diamine Colours also possess good fastness to rubbing and washing, which is a decided advantage for flannelettes, particularly for such as are used largely for underwear.

Pale and bright shades such as *scarlet, light* and *medium blues, violet, pink, yellow, etc.* are usually in demand for these articles; and besides these, *grey* and a large variety of *mode shades* are in request for lambskin imitations.

The brightest shades of *scarlet* are obtained with Diamine Scarlet B, more bluish scarlets with Diamine Scarlet 3B, both requiring besides Glauber's salt an addition of 5—8% borax.

The most level dyeings are obtained with Diamine Scarlet at a temperature of 80—90° C. (175—195 deg. F.); at a higher temperature the wool absorbs too much colour.

Both these brands of Diamine Scarlet are frequently also used in combination with Diamine Red 4B or Diamine Red 6B, in which case a higher temperature may be maintained and the addition of borax dispensed with.

Full shades of Red and Claret are dyed with

Diamine Red (all brands)
Diamine Purpurine (all brands)
Diamine Bordeaux B, S, VRO
Oxy Diamine Violet B, R

without the addition of borax.

Bright Pale Blues and Pale Greens are dyed with

Diamine Sky Blue or Diamine Sky Blue FF,
Formyl Blue B and
Brilliant Milling Green B

or, Diamine Sky Blue or Diamine Sky Blue FF,
Thioflavine S and
Brilliant Milling Green B

with the addition of Glauber's salt.

Bright Medium Blues are dyed with

Diamine Sky Blue (all brands),
Diamine Brilliant Blue G or
Oxy Diamine Blue (all brands)

in conjunction with

Alkaline Blue

and the addition of Glauber's salt and 2—5 % borax, the Alkaline Blue being raised by rinsing in a weak acetic acid bath; the shades may if required be topped with

New Methylene Blue or
Victoria Blue B

in a fresh bath with the addition of a little acetic acid.

Bright Violets are bottomed in a hot Glauber's salt bath with suitable Diamine Colours such as.

Diamine Violet N
Diamine Heliotrope G, B, O,
shaded if necessary with
Diamine Brilliant Blue G
Oxy Diamine Blue G, 3G

and topped in a fresh bath with

Methyl Violet or
Magenta Ia. Dia. small crystals.

The topping is carried out with the addition of about 5 % acetic acid, entering cold and raising the temperature gradually in order to dye the wool, — in the case of Methyl Violet to the boil and of Magenta to about 40° C. (105 deg. F.).

For Bright Pinks,

Diamine Rose (all brands)
is used, shaded with
Erythrosine
Rosazeïne or
Irisamine G;

Diamine Orange F
may serve as a yellow constituent. For very yellowish pinks,
Diamine Scarlet B
may be used.

Yellow is dyed, according to the shade required, with

Thioflavine S
Oxy Diamine Yellow GG, TZ
Diamine Yellow CP,
topped if necessary with
Thioflavine T.

A very fine shade of *gold* may be obtained by combining
Thioflavine S and
Naphtol Yellow S,
and dyeing at 50° C. (120 deg. F.) with the addition of 10—20% Glauber's salt and 2% acetic acid.

For very bright pale shades, colours which have been stoved after dyeing have proved very satisfactory; full directions for the production of such shades are given on page 49.

Grey and mode shades, also blacks, blues and browns are obtained according to the directions on pages 55—57.

We refer here to the dyeings shown in the following tables and to our special card No 2518, "Mode Shades on Unions (Lambskin Imitations and Hosiery").

Union Hosiery and Union Felt.

In the case of hosiery materials and union felts, the cotton appears together with the wool on the surface of the goods; great care should therefore be exercised with a view to dyeing the cotton a deep enough shade and corresponding sufficiently well with that of the wool.

It is thus recommended rather to dye the cotton a little darker than the wool, especially in the case of mode shades, giving preference to the dyestuffs of Group II.

Union Hosiery.

Black is produced very generally with

Diaminogene B or
Oxy Diaminogene OT

and the addition of a little

Formyl Violet 10B

in an acetic acid bath, thereupon diazotising and developing with Beta Naphtol and Phenylene Diamine (see page 47).

Union Fast Black J

has likewise proved particularly well adapted for dyeing this article on account of its good fastness to washing and excellent fastness to light; besides these products, the other brands of

Union Black, viz, P, BG, 2B, 3B, and
Oxy Diamine Black (all brands)

are used.

For Navies, combinations of the following are recommended:

Diamine Black BH and
Lanacyl Navy Blue B, BB
shaded if necessary with
Diamine Heliotrope G, B, O and
Formyl Violet (all brands)
Formyl Blue B.

All the other shades are dyed with the usual combinations in the customary manner. See also pattern card No 2006, "Diamine Colours on Union Hosiery".

Union Felt.

Union felts are dyed almost invariably according to the one-dip process, and as almost any shade is practically in demand for this material, all the dyestuffs suitable for half-wool dyeing come into consideration.

Owing to the inferior quality of these goods generally, dyestuffs of a low cost are as a rule given the preference for producing dark shades. The following are some of the products which are regularly used:

For Black:

Para Diamine Black B, BB
Oxy Diamine Black JEI, JB, JW, FFC, etc.
in conjunction with
Naphtylamine Black 4B, X3B, 00, etc.
shaded if necessary with
Formyl Violet S4B or
Formyl Blue B.

For Dark Blue:

Oxy Diamine Black (all brands)
in conjunction with
Diamineral Blue R, CV
Oxy Diamine Blue G
Diamine Black BH
Naphtol Blue Black
Naphtylamine Black 4B, X3B, 00, etc.
Formyl Violet (all brands)

For Brown:

Combinations of

Diamine Brown 30a
Oxy Diamine Brown G
Oxy Diamine Black JW
Naphtol Blue Black
Indian Yellow G
Orange extra.

For Dark Greens:

Combinations of

Diamine Dark Green N
Oxy Diamine Black JEI
Brilliant Milling Green B
Naphtol Blue Black.

For bright Pale Greens:

Combinations of

Diamine Sky Blue FF
Oxy Diamine Yellow GG, TZ
Thioflavine S
Brilliant Milling Green B
Naphtaline Yellow

topped if necessary with

Brilliant Green cryst. extra.

For Olives:

Combinations of

Diamine Black HW
Diamine Sky Blue FF
Diamine Steel Blue L
Oxy Diamine Blue 5G
Oxy Diamine Yellow GG, TZ
Diamine Fast Yellow A, M
Diamine Orange B
Brilliant Milling Green B
Naphtol Blue Black
Indian Yellow G, R
Orange extra.

For Reds and Clarets, according to the desired shade:

Diamine Red 4B, 5B, 6B, 10B
Diamine Bordeaux B, S, VR0
Oxy Diamine Violet B, R

and for very bright scarlet shades:

Diamine Scarlet B
topped if necessary with
Rosazeïne or
Diamine Orange D.

For Mode Colours:

Combinations of

Union Black S
Diaminogene B
Diamine Orange B
Diamine Catechine G, 3G, B
Diamine Fast Yellow B, FF
Diamine Bordeaux B
Lanacyl Blue BB, R
Naphtol Blue Black
Orange extra
Indian Yellow G
Azo Red A.

For the Leather Shades so much in demand for felt:

Diamine Orange B
Diamine Catechine 3G
shaded with
Diamine Fast Yellow M
Diamine Brown 3G
Union Black S
Diaminogene B
Lanacyl Blue BB, R
Naphtol Blue Black.

The dyeing must be carried out as rapidly as possible, to prevent the quality and stability of the material from being affected by prolonged boiling and turning.

If after boiling for some time the wool is not dyed sufficiently, it is brought to shade by adding some more wool dyestuff.

In case the dyeings produced with Diamine Colours are not bright enough in certain instances, the goods are topped with basic colours in a fresh cold or lukewarm bath with the addition of a little acetic acid.

We would herewith refer to the patterns shown in the following tables, and also to those shown in our special card No 2043, "Diamine Colours on Felt (Wool and Cotton Mixed)".

Flannelette.	Union Hosiery.
1	6
0,015 % Diamine Sky Blue FF 0,01 % Thioflavine S 0,02 % Brilliant Milling Green B.	0,16 % Diamine Brown GWA 0,01 % Diaminogene B 0,01 % Lanacyl Blue BB 0,05 % Diamine Fast Yellow B 0,09 % Diamine Fast Yellow A.
2	7
1,5 % Diamine Orange F 0,15 % Diamine Orange D 0,35 % Orange extra.	2,8 % Diamine Bordeaux B 1,5 % Diamine Red 4B 0,15 % Diamine Orange D.
3	8
0,12 % Alkaline Blue 6B cotton-dyed at 40° C. (105 deg. F.) with 1 % Methyl Blue for cotton 1 lb alum per 10 gallons liquor.	0,2 % Diamine Fast Black F 0,01 % Diamine Bordeaux B 0,1 % Lanacyl Navy Blue B.
4	9
0,65 % Diamine Rose GD 3,5 % Erythrosine B 2 lbs Glauber's salt per 10 gallons liquor 1,5 % acetic acid dyed at 50° C. (120 deg. F.).	1 % Diamineral Brown G 3 % Diamine Orange B 0,12 % Orange extra.
5	10
4,5 % Thioflavine S 1,5 % Naphtol Yellow S 2 lbs Glauber's salt per 10 gallons liquor 2 % acetic acid dyed at 50° C. (120 deg. F.)	5,5 % Oxy Diamine Black JW.

Nos 1 and 2, 6–10 are dyed according to the one-dip process. No 3 is dyed near boiling point with the addition of 3–5 % borax, then soured off, and the cotton covered as indicated.

Flannelette.

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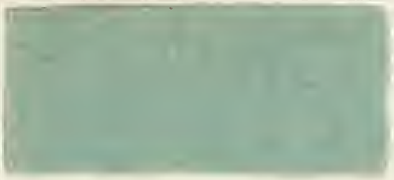

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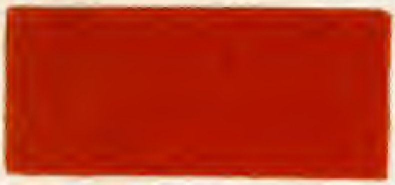

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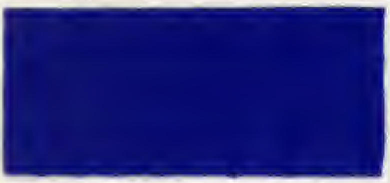

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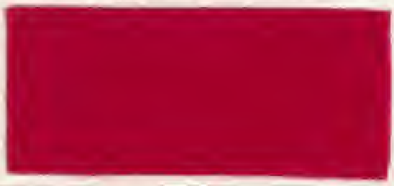

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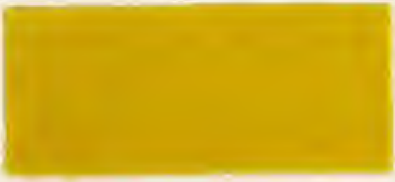

Union Hosiery.

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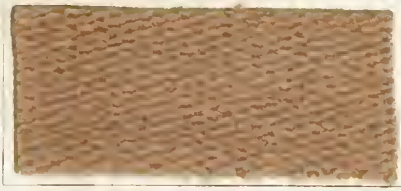

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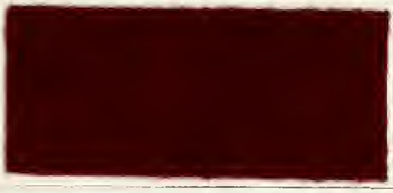

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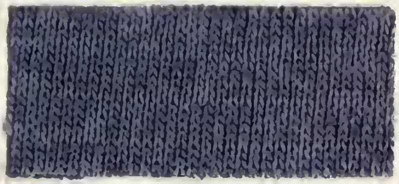

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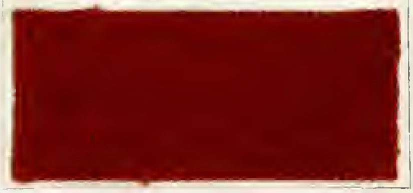

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Union Felt.

1 1 % Diamine Orange B 0,25 % Diamine Fast Yellow M 0,10 % Union Black S 0,04 % Lanacyl Blue BB.	6 2 % Diamine Scarlet 3B 0,5 % Diamine Red 4B.
2 0,04 % Diaminogene B 0,01 % Diamine Orange B 0,06 % Diamine Catechine B 0,02 % Formyl Blue B.	7 1,2 % Oxy Diamine Yellow TZ 0,2 % Oxy Diamine Blue 5G 0,03 % Diamine Orange B 0,05 % Formyl Blue B.
3 0,05 % Diaminogene B 0,01 % Lanacyl Navy Blue B 0,1 % Diamine Catechine B 0,06 % Diamine Orange B 0,15 % Diamine Orange D.	8 0,19 % Diaminogene B 0,15 % Diamine Orange B 0,3 % Indian Yellow G 1,2 % Diamine Fast Yellow B 0,3 % Diamine Orange D.
4 1,5 % Oxy Diamine Black A 0,3 % Naphtylamine Black X3B 2 % Diamine Brown 30a 0,5 % Diamine Red 5B.	9 1,2 % Oxy Diamine Blue G 0,75 % Formyl Blue B 0,15 % Victoria Blue B.
5 1 % Oxy Diamine Black A 0,4 % Naphtylamine Black X3B 3 % Oxy Diamine Blue 3G 1 % Formyl Blue B 0,3 % Formyl Violet 10B.	10 0,25 % Oxy Diamine Violet R 0,25 % Formyl Violet S4B 0,25 % Croceïne AZ 0,6 % Methyl Violet R No I.

Dyed according to the one-dip process.
Nos 9 and 10 were topped in a fresh cold bath.

Union Felt.

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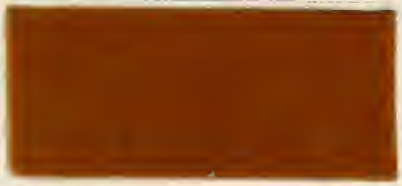

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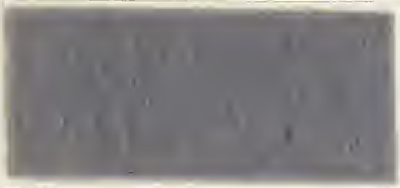

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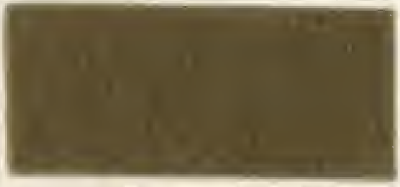

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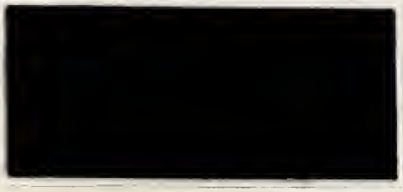

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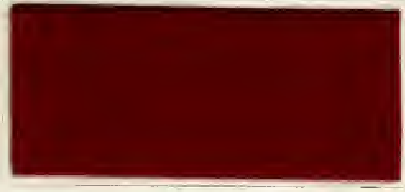

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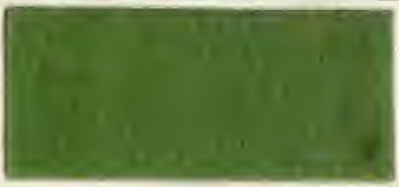

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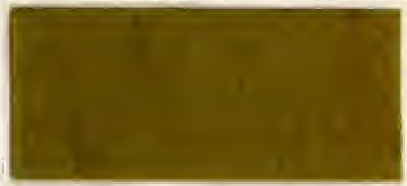

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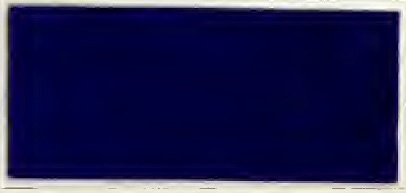

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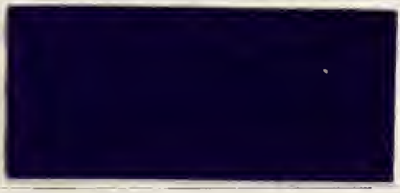

Shoddy Goods containing a Cotton Warp.

According to their quality and the percentage of cotton they contain, union shoddy goods are dyed by one of the following methods:

1. The one-dip process (page 35);
2. Dyeing the wool first and the cotton subsequently (page 39);
3. Dyeing the cotton first with dyestuffs fast to acids and cross-dyeing the wool in a fresh bath (page 46);
4. Dyeing the cotton during the milling process and then cross-dyeing the wool (page 47).

In consequence of the considerable difference in cost between light- and dark-coloured shoddies, comparatively bright pale shades are frequently required to be dyed on dark material. Although it is not always possible to comply with such a request, sufficiently bright dyeings may be obtained in a great many cases by previously stripping the dark ground of the material.

The stripping methods most in use are described on page 51.

1. One-dip Process.

If the goods to be dyed by the one-dip process have been stripped, they must be neutralised first and then rinsed again before dyeing. Vats which have been used for dyeing with acids or for stripping purposes should previous to dyeing be cleared well by boiling with soda.

The more or less dark appearance of the raw shoddy goods is as a rule due merely to the colour of the wool, the cotton being almost invariably woven up in the grey or white state.

This fact, as also the property of stripped shoddy to absorb dyestuff more easily than ordinary wool, are frequently the cause of the cotton showing up too light and the wool too dark.

When dyeing according to the one-dip process it is therefore best to use the dyestuffs of Group II, starting in a hot bath, and only then gradually raising the temperature of the dyebath sufficiently high to dye the wool, which is generally accomplished at a temperature of 80—90° C. (175—195 deg. F.).

Goods stripped in an acid bath must be thoroughly neutralised before being entered into the dyebath.

2. Dyeing the Wool first in an Acid Bath and covering the Cotton subsequently.

This method is applied particularly for dark shoddy goods on which sufficiently bright and level shades cannot be obtained by the one-dip process.

By cross-dyeing in an acid bath, the coloured ground shade of the material is stripped to a certain extent, which ensures better levelling and greater brightness of the shades. Easily levelling colours are used for this purpose with a large addition of sulphuric acid (6—12%).

After cross-dyeing, the goods are rinsed well, and the cotton is then covered in a cold or lukewarm bath as described on page 41.

This is effected with the dyestuffs mentioned on pages 42 and 43 in a dye-vat, or, to still better advantage, in a washing-machine with as short a liquor as possible charged with

$$\left.\begin{array}{ll} 4 & \text{lbs cryst. Glauber's salt and} \\ 3/4\text{—}1\,1/2 & \text{oz soda ash} \end{array}\right\} \text{per 10 gallons liquor.}$$

If the goods are stripped with sulphuric acid or bichromate of potash and sulphuric acid before dyeing, suitable acid-dyeing colours may be added straight to the stripping bath after cooling it to some extent.

When stripping with sulphuric acid alone, any of the easily levelling colours (see our Fashionable Shade Card 1905/06, No 2698) can be applied in the stripping bath.

In stripping with bichromate of potash and sulphuric acid, the following colours, which become only slightly duller in a bath containing these ingredients, can be satisfactorily topped in the stripping bath:

Naphtol Yellow S
Fast Yellow S
Acid Yellow AT
Indian Yellow G, R
Orange extra, II
Orange EN, ENZ
Scarlet FR, F2R, F3R
Brilliant Cochineal 2R, 4R
Brilliant Orseille C
Azo Orseille BB
Acid Magenta
Acid Violet 4RS
Fast Acid Green BN
Cyanole Fast Green G
Acid Green extra conc.
Brilliant Milling Green B
Cyanole FF, extra, GG
Formyl Blue B
Brilliant Milling Blue B
Formyl Violet 10B, S4B.

3. Dyeing the Cotton first and then cross-dyeing the Wool.

For dyeing the cotton,

Oxy Diamine Black SA, US, UI
Para Diamine Black B, BB or
Diamine Milling Black B conc., FG extra

are used principally and are dyed according to the method described on page 46.

Easily levelling colours are mostly used for cross-dyeing the wool.

The topping bath is charged with the requisite dyestuff and the quantity of acid necessary for exhausting the bath; the goods are entered into the tepid bath, which is gradually brought to the boil, boiling being maintained for $^1/_2 - ^3/_4$ hour.

The dyebath must be distinctly acid from the very beginning, because the cotton dyestuff is easily boiled off the fibre in a neutral bath.

The black previously dyed on the cotton is converted into a brown by stripping the goods with bichromate of potash and sulphuric acid, and this method can therefore be applied on previously dyed goods in special cases only.

4. Dyeing the Cotton in the Milling Machine.

A fourth method, which on account of its simplicity and cheapness has been readily adopted, is that of dyeing the cotton while milling the goods.

The dyestuffs which here come in the first place into consideration as very suitable are:

Diamine Milling Black B conc., FG extra
Para Diamine Black B, BB
Oxy Diamine Black SA, US

which also resist a subsequent acid cross-dyeing and are applied according to the method indicated on page 47.

For cross-dyeing, the wool colours which dye easily level in an acid bath are likewise given the preference.

If the wool is not to be cross-dyed, any of the Diamine Colours may be used for dyeing in the milling process. Shot or mixture effects may thus be obtained with the greatest ease if the shade dyed on the cotton is different to the ground colour of the shoddy.

Half-wool Shoddy Goods dyed by the one- or the two-bath method.

1 Raw material for Nos 2–5.	6 Raw material for Nos 7–10.
2 0,2 % Diamine Black BH 0,1 % Diamine Dark Green N.	7 Stripped with a) 5 % and b) 10 % Hyraldite A 5 % and 10 % acetic acid.
3 1 % Diamine Black BH 1,25 % Formyl Violet 10B.	8 Stripped with 3 % bichromate of potash 6 % sulphuric acid cotton-dyed with 3/4 oz Diamine Orange D 7/16 „ Diamine Black RMW per 10 gallons liquor.
4 3 % Diamine Bordeaux VR0.	9 Stripped like No 7a and topped with 2 % Scarlet FR 1 1/2 oz Diamine Nitrazol Brown G per 10 gallons liquor.
5 Stripped with 3 % bichromate of potash 6 % sulphuric acid topped with 0,6 % Diamine Orange D 0,2 % Diamine Black BH 0,1 % Oxy Diamine Brown RN.	10 0.25 % Thiocarmine R powder 1 % Indian Yellow G 5 % sulphuric acid 3/4 oz. Diamine Black BH 1 1/8 „ Diamine Fast Yellow A per 10 gallons liquor.

Half-wool Shoddy Goods dyed by the one- or the two-bath method.

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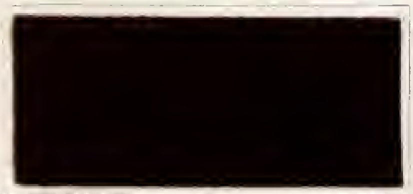

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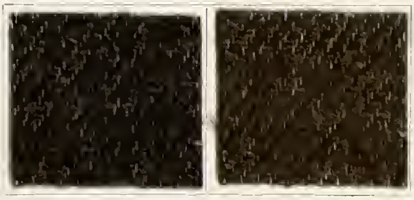

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Half-wool Shoddy Goods
warp-dyed and then cross-dyed.

1 Raw material for Nos 2—5. Dyed for ¾ hour at 60—70° C. (140—160 deg. F.) 5,5 % Oxy Diamine Black US 0,1 % Diamine Fast Yellow A.	6 Raw material for Nos 7—10. Milled with the addition of 1,75 % Oxy Diamine Black US extra conc.
2 Dyed like No 1, stripped with 3 % bichromate of potash 6 % sulphuric acid cross-dyed with 1,25 % Scarlet FR.	7 Dyed like No 6, stripped with 3 % bichromate of potash 6 % sulphuric acid.
3 Dyed and stripped like No 2 and cross-dyed with 1 % Indian Yellow G.	8 Dyed and stripped like No 7 and cross-dyed with 0,25 % Indian Yellow G.
4 Dyed like No 1 and cross-dyed with 1,5 % Acid Green extra conc. 4 % sulphuric acid.	9 Dyed and stripped like No 7 and cross-dyed with 2 % Scarlet F3R.
5 Dyed like No 1 and cross-dyed with 1 % Water Blue B 4 % sulphuric acid.	10 Dyed like No 6, cross-dyed with 0,25 % Thiocarmine R powder 1 % Indian Yellow G 10 % sulphuric acid.

Half-wool Shoddy Goods
warp-dyed and then cross-dyed.

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Burl-Dyeing.

The picking of burls, which are frequently to be found in pure woollen goods, by means of a burling iron is very apt to cause holes in the material, at the same time entailing loss of time as is also the case when burl-dyeing with burling ink.

Burl-dyeing with Diamine Colours offers on the other hand the advantages of *leaving the material in a better condition, a shorter and simpler method of working,* and, in addition thereto, *of imparting to the goods a softer handle* than that obtained by burl-dyeing with sumac and iron.

By using Diamine Colours the burls are dyed the same shade as the piece, and are in consequence less visible; besides, paler and brighter shades may be obtained than is possible when covering with sumac and iron.

The method of working is as follows:

The goods after being milled and washed or dyed in an acid bath are rinsed well and thereupon covered either in a dolly, broad-washing machine, jigger or dye-vat.

For this purpose a cold or tepid bath is prepared with the requisite dyestuff,

$$\left.\begin{array}{ll} 2—4 & \text{lbs cryst. Glauber's salt and} \\ \frac{3}{4}—1\frac{1}{2} & \text{oz soda ash} \end{array}\right\} \text{per 10 gallons liquor,}$$

in which the goods are run until sufficiently covered ($\frac{1}{2}$—$\frac{3}{4}$ hour).

Diamine Black RMW is of primary importance amongst the Diamine Colours suitable for covering purposes, and gives satisfactory results in most cases. If however the cotton and the wool are to be dyed a uniform shade, the Diamine Colours mentioned on pages 42 and 43 should be used.

After covering, the goods are rinsed thoroughly in water.

Union Braids.

The practicability of dyeing the greatest variety of shades on materials composed of wool and cotton in the simplest manner possible has been exceedingly helpful in the developing of the velour braid industry.

The braids are usually dyed like other union goods by the one-dip process in a neutral Glauber's salt bath, with the combinations given for worsteds and cheviots on pages 55 to 57.

Uniformity of the shade of the wool and the cotton is essential for this article, and on this account dyestuffs are usually selected which dye the wool and the cotton as solid a shade as possible.

Dyeings produced with Diamine Colours are in the majority of cases fast to stoving and very resistant to alkaline street dirt.

Besides black, which is the staple colour, any pale or dark fashionable shade is produced, and any of the combinations of dyestuffs mentioned on pages 55 to 57 and 64 as being used for worsteds and ladies' dress materials may be applied.

For cheap Blacks,

Oxy Diamine Black JWF, JW, JB

are dyed in combination with

Formyl Violet 10B, S4B
Formyl Blue B,

and for better-class goods

Union Black OJGJ and 814J

are used.

Pale bright shades such as cream, pink, pale blue, green etc., are dyed according to the directions on page 49.

See also our special pattern card No. 2096, "Diamine Colours dyed in one bath on braids composed of wool and cotton".

Union Braids.

1 0,03 % Diaminogene B 0,08 % Lanacyl Blue R 0,02 % Azo Red A 0,06 % Diamine Catechine B 0,07 % Formyl Blue B.	7 2,2 % Diamine Red 5B 0,5 % Diamine Red 10B.
2 0,06 % Diamine Rose BD 0,02 % Rosazeïne B.	8 0,4 % Diaminogene B 0,2 % Lanacyl Blue R 0,5 % Oxy Diamine Brown RN 1,75 % Diamine Brown 30a.
3 1 % Diaminogene B 2 % Oxy Diamine Black JWF 1 % Formyl Blue B 1 % Alkaline Blue B.	9 1 % Diamine Green G 1 % Diamine Steel Blue L 0,7 % Brilliant Milling Green B.
4 0,25 % Diaminogene B 0,6 % Diamine Catechine B 0,38 % Lanacyl Blue R 0,8 % Diamine Orange B.	10 0,5 % Diamine Violet N 0,3 % Diamine Brilliant Blue G 0,6 % Formyl Violet S4B.
5 0,1 % Diaminogene B 0,05 % Diamine Catechine B 0,13 % Lanacyl Blue R 0,4 % Diamine Orange B.	11 0,7 % Oxy Diamine Blue 3G 0,3 % Oxy Diamine Blue 5G 0,5 % Formyl Blue B.
6 0,55 % Diaminogene B 1,75 % Diamine Orange B 1 % Diamine Yellow CP 0,45 % Lanacyl Blue BB.	12 5 % Oxy Diamine Black JWF.

Dyed according to the one-dip process.

Union Braids.

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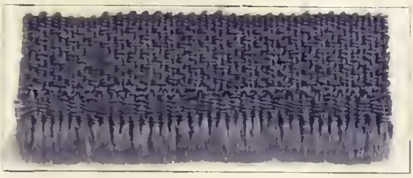

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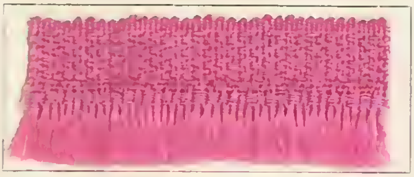

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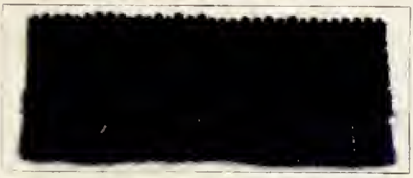

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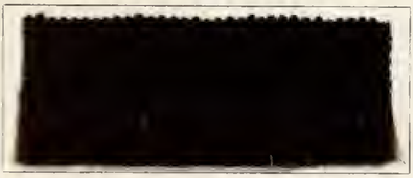

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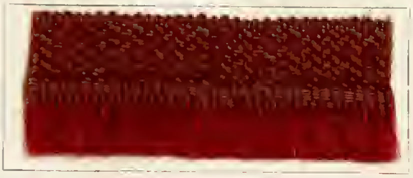

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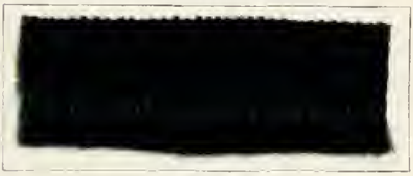

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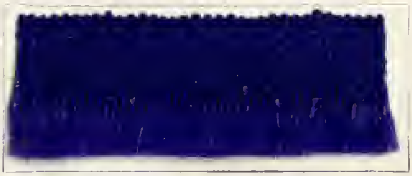

12

Union Yarns.

Union yarns are dyed like union piece-goods with the same dyestuffs as recommended for the latter.

Dyeings produced with Diamine Colours possess good fastness to washing and milling, and in this respect, especially for pale shades, the direct dyeings should already prove sufficient for most purposes. If, however, special demands are made with regard to fastness to milling, the following products may be used aftertreated with metallic salts:

Diamine Fast Yellow A, B, FF	aftertreated with: bichromate of potash or bichromate of potash and sulphate of copper
Diamine Orange B, D	
Diamine Brown 3G, M, B	
Diamineral Brown G	
Oxy Diamine Brown G, RN	
Diamine Catechine B, G, 3G	
Diamineral Blue R, CV	
Diamine Dark Blue B	
Diamine Sky Blue FF	sulphate of copper
Diamine Blue RW	
Diamine Green G	chromium fluoride or chrome-alum
Diamine Fast Red F	
Diamine Bronze G	
Diamine Jet Black SS, 00, Cr,	bichromate of potash.

As neutral-dyeing wool colours fast to milling, the following products come into consideration:

Formyl Violet, all brands
Alkaline Violet C, CA
Brilliant Milling Blue B
Formyl Blue B
Brilliant Milling Green B
Alkaline Blue (all brands)
Anthracene Yellow C
Naphtyl Blue Black FB, FBB.

The dyeing is carried out in a neutral bath as usual and the aftertreatment in a second bath charged with the requisite metallic salts and 2—4 % acetic acid, the yarns being worked for 30 to 35 minutes at abt. 60° C. (140 deg. F.), and then rinsed.

The quantities of metallic salts to be used are regulated by the depth of the respective shades, about two-thirds the weight of the dyestuff being usually required, but never more than 3 % (reckoned on the weight of the goods).

The aftertreatment as a rule causes a slight alteration in the shade, on which account it is recommended to take off a small swatch for matching before completing the whole lot and to pass it through the solution of metallic salts which come into consideration.

In addition to the various mode shades, especially staple shades of browns and blues fast to milling are produced on union yarn, which is then aftertreated with bichromate of potash and acetic acid. The following colours deserve special mention for this purpose:

Brown: Diamine Brown M, 3G
Oxy Diamine Brown G
Diamineral Brown G
Diamine Catechine G, 3G
shaded with
Diamine Fast Yellow A, B, FF and
Diamine Jet Black SS, 00, Cr.

Blue: Diamineral Blue R, CV
Diamine Jet Black SS, 00, Cr
Formyl Blue B and
Formyl Violet (all brands).

Black of good fastness to milling is dyed with
Oxy Diamine Black US, JW, JWF, etc.
Para Diamine Black B, BB
aftertreated for 20—30 minutes in a cold or lukewarm bath with 3 % formaldehyde and 1 % acetic acid, or with 3 % bichromate of potash and 1 % acetic acid; or, with similarly good fastness to light also, with
Diamine Jet Black SS, 00, Cr
aftertreated with 3 % bichromate of potash and 1 % acetic acid.

For a cheap black of a deep shade and possessing good fastness to milling next to white cotton,
Oxy Diamine Black JW and JWF
dyed in combination with
Formyl Violet 10B
and aftertreated with Nitrazol (see page 114) are likewise very well suited.

Union Yarns (Angola Yarns).

1

0,25 % Diamineral Blue R
0,17 % Diamine Orange B
0,1 % Formyl Blue B
0,5 % bichromate of potash.

2

3 % Diamine Fast Red F
0,5 % Rosazeïne B
3 % chromium fluoride.

3

2,5 % Diamineral Blue CV
1,5 % Brilliant Milling Blue B
1 % bichromate of potash.

4

0,75 % Diamine Jet Black SS
1,75 % Diamineral Brown G
0,6 % Oxy Diamine Brown RN
0.4 % Diamine Jet Black 00
3 % bichromate of potash.

5

6,5 % Oxy Diamine Black JWF
0,15 % Diamine Fast Yellow A
3 % formaldehyde.

6

0,2 % Diamine Orange B
0,15 % Formyl Blue B
0,6 % Diamine Fast Yellow B
1,5 % Diamine Jet Black SS
2 % bichromate of potash.

7

0,15 % Diamine Jet Black SS
0,5 % Diamine Catechine 3G
0,2 % Oxy Diamine Brown RN
0,5 % bichromate of potash.

8

2 % Diamine Brown M
1 % Oxy Diamine Brown RN
2,5 % bichromate of potash.

9

2,5 % Diamineral Blue CV
1,5 % Brilliant Milling Blue B
2 % Diamine Jet Black SS
3 % bichromate of potash.

10

3,5 % Diamine Jet Black 00
4 % Diamine Jet Black SS
0,85 % Brilliant Milling Green B
3 % bichromate of potash.

Dyed according to the one-dip process. Nos 1–4, 6–10 aftertreated in a fresh bath of 50–60° C. (120–140 deg. F.) with the addition of 1 % acetic acid in each case, No 5 in a cold bath, with 3 % formaldehyde and 1 % acetic acid.

Union Yarns (Angola Yarns).

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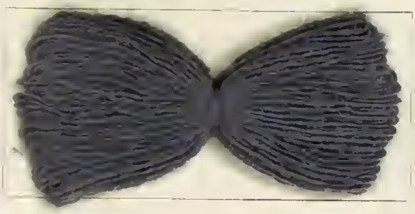

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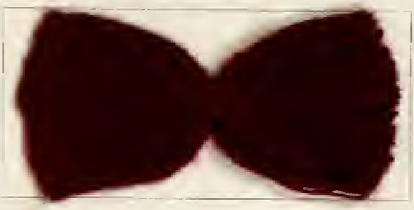

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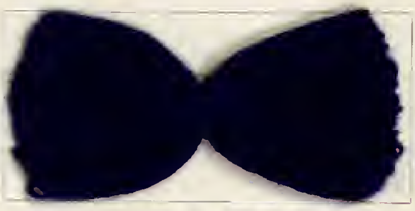

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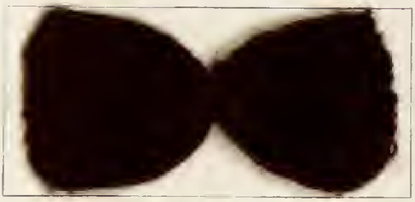

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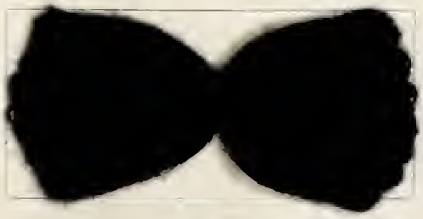

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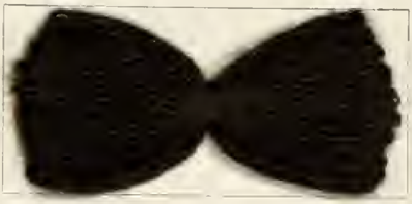

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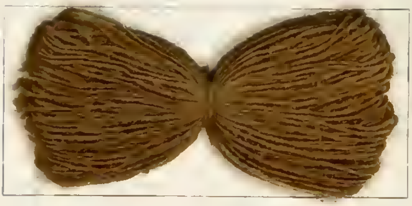

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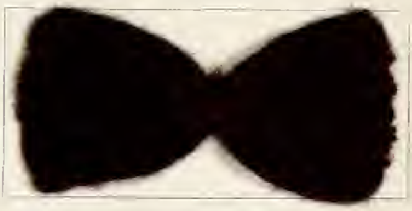

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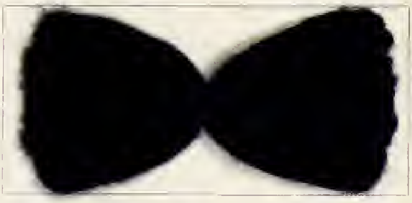

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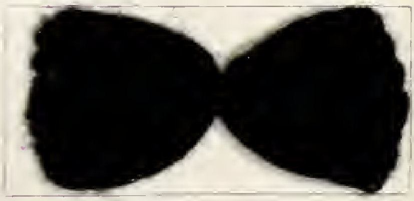


Shoddy, pulled Rags, Waste, etc.

In order to economise in expenditure and time, and to prevent loss in weight resulting from carbonising, these materials are now frequently dyed in the uncarbonised state without regard to any vegetable residue contained therein, by dyeing the latter the same shade as the wool. This is carried out according to the one-dip process with Diamine and Wool Colours in the same manner as with union goods, in a very short neutral bath.

Charge the dyebath with the requisite quantities of dyestuff and 30% cryst. Glauber's salt, boil up the liquor, enter the material, and dye either boiling or near the boil according to the nature of the goods in question.

In almost every instance the direct shade will be sufficiently fast already to milling; for more exacting demands, however, this fastness can be improved by an aftertreatment.

This aftertreatment is carried out as described for union yarns with the dyestuffs there mentioned as suitable for such treatment.

In by far the majority of cases the material is dyed black, and for this purpose our *Oxy Diamine Blacks JW* and *JWF*, dyed direct, are most extensively used.

Dyeings with still better fastness to milling may be obtained with the last-mentioned brands, and particularly also with

Para Diamine Black B, BB and OAKH
Oxy Diamine Black SA, US and UI

by aftertreating them with formaldehyde as described on page 113.

Dyeings of very good fastness to milling and withstanding also cross-dyeing in an acid bath are obtained with

Oxy Diamine Black JW or JWF

in combination with

Formyl Violet 10B

and by subsequently coupling with Nitrazol C in the rinsing bath according to the directions on page 114.

Dyeings of

Diamine Jet Black SS or 00

in combination with

Brilliant Milling Green B

and subsequently chromed with bichromate of potash in a fresh bath are very fast to milling and atmospheric influences.

Regarding the dyeing of shoddy see also our special pattern cards Nos 2285, 2313, 2728 and 2757.

A Black fast to milling on waste wool containing cotton and silk is produced to best advantage with Oxy Diamine Black JW and JWF.

Dye with the addition of 20% cryst. Glauber's salt, boil up the bath, enter the goods, work for 1/2 hour without steam, then boil for 1/2—3/4 hour, and if necessary allow to feed for 1/2 hour in the cooling bath.

This black possesses good fastness to milling, which can however be still further improved by an aftertreatment with formaldehyde or by coupling with Nitrazol C.

Aftertreating with formaldehyde is best carried out in a cold or lukewarm rinsing bath charged with 3% formaldehyde and 1% acetic acid (reckoned on the weight of the material), the pieces being allowed to run for 20 to 30 minutes.

The formaldehyde and acetic acid may be added to the dyebath if it is not to be used over again, but it should be previously cooled down to about 80° C. (175 deg. F.).

The *coupling with Nitrazol C* is likewise done in the rinsing bath as described on the next page.

Coupling with Nitrazol C. The goods dyed with Oxy Diamine Black JW or JWF are rinsed lightly, whereupon the flow of rinsing water is suspended and a solution of

3 % Nitrazol C
0,75 % soda ash
0,2 % acetate of soda

} calculated on the weight of the goods

added to the rinsing bath; the goods are then worked for 20 to 30 minutes without any further supply of fresh water, and the rinsing is finally completed.

Nitrazol is dissolved by stirring with a little cold water (not above 20—25° C. (65—75 deg. F.); any lumps that may have formed should be carefully broken up, the Nitrazol being finally brought into complete solution by pouring over it a sufficient quantity of cold water.

The cold coupling bath is charged by first adding the Nitrazol solution and then the soda and acetate of soda.

Dyeing Union Goods containing Silk.

The dyeing of goods composed of wool, silk and cotton is a little more difficult than dyeing ordinary unions; it requires more skill and attention and above all an exact knowledge of the behaviour of the individual dyestuffs towards the three fibres.

Goods containing all three fibres may like ordinary unions be dyed solid shades or with shot or multi-coloured effects

1. by first dyeing the wool and silk a solid shade and dyeing the cotton a different shade,
2. by dyeing the cotton first and then dyeing the wool and silk to the same or any other shade subsequently,
3. by dyeing the wool first and then dyeing the cotton and silk the same or different shades.

a) Solid Shades.

The one-dip process is the simplest and most generally employed method for producing solid shades, and its application is greatly facilitated by the property of many Diamine Colours to dye wool, silk and cotton a fairly solid shade.

As such we may mention:

Thioflavine S
Oxy Diamine Yellow GG, TZ
Diamine Fast Yellow 3G, M
Diamine Orange F
Diamine Catechine G, 3G
Diamine Brown R, M, BWA, GWA, No. 40
Oxy Diamine Brown G, 3GN
Diamineral Brown G

Diamine Rose BD, GD
Diamine Scarlet B, 3B
Diamine Red 4B, 5B
Diamine Fast Red F
Diamine Bordeaux B, S
Diamine Violet N
Oxy Diamine Violet B, G
Diamine Blue RW
Oxy Diamine Blue 5G, 3G, G

Diamine Green B, G, CL
Diamine Dark Green N
Diamine Black HW
Union Black S
Oxy Diamine Black S000, N, JW, JB.

The following dyestuffs are suitable for shading the wool and the silk:

Milling Yellow 0
Indian Yellow G, FF
Orange extra
*Brilliant Cochineal 4R
Roccelline
Rosazeïne B
Irisamine G
Wool Red B
Milling Red G
Brilliant Milling Green B
Brilliant Milling Blue B
Formyl Blue B
Formyl Violet S4B
Alkaline Violet CA
*Lanacyl Violet B
*Lanacyl Blue BB, R
*Lanacyl Navy Blue BB, B
*Naphtol Blue G, R
*Wool Blue OD
Wool Blue OC, OJF
*Naphtol Blue Black
Neutral Wool Black B.

Those marked with an asterisk (*) are absorbed almost entirely by the wool and leave the silk practically colourless.

The *method of dyeing* to be followed is similar to that for unions:

Charge the dyebath with the requisite quantities of Diamine Colours, supplemented if necessary with neutral-dyeing wool colours, and with

$^1/_2$ — 1 lb cryst. Glauber's salt per 10 gallons liquor;

enter the goods at 50—60° C. (120—140 deg. F.), raise the temperature gradually to the boil, boil for 15 to 20 minutes, and run for about $^1/_2$ hour in the bath whilst cooling off. If the wool be then found to be still too pale, the bath is heated again almost to boiling, wool colours being added, if necessary, for shading.

A proper regulation of the temperature is an essential condition for producing absolutely solid shades; below the boil the dyestuffs go more on to the cotton and silk, by boiling, however, the wool is dyed more intensely. Prolonged boiling strips the dyestuff off the cotton and silk again and makes it go more on to the wool, the latter being thus dyed too deep a shade: careful attention should therefore be given to the boiling of the bath.

As a rule, neutral-dyeing wool colours have to be used for shading, similarly as for unions; this is however somewhat more difficult in so far as the silk absorbs an excess of colour at too low a temperature, too much colour on the other hand being absorbed by the wool if the temperature be too high.

If the one-dip process does not yield a perfectly solid shade, the wool and cotton are first dyed to approximately the desired tone and the silk is then shaded with acid colours in a fresh, lukewarm bath acidulated with acetic acid.

Suitable dyestuff combinations for the one-dip process are the following:

for Pink:

0,20 % Diamine Rose BD
shaded if necessary with
Rosazeïne B;

for Red:

3,5 % Diamine Scarlet B
shaded if necessary with
Diamine Red 4B;

for Claret:

2 % Diamine Bordeaux B
2 % Diamine Bordeaux S
0,3 % Diamine Orange D;

for Yellow Brown:

3 % Diamine Brown R
0,3 % Diamine Orange D
0,1 % Formyl Blue B;

for Coffee Brown:

4 % Diamine Brown M
0,3 % Formyl Blue B;

for Pale Green:

1,25 % Diamine Green B
1 % Diamine Sky Blue FF
1,25 % Oxy Diamine Yellow TZ
1,1 % Brilliant Milling Green B;

for Dark Green:

4 %	Diamine Green B
0,4 %	Brilliant Milling Green B;

for Navy Blue:

1,75 %	Diamineral Blue R or CV
1 %	Oxy Diamine Black JW
0,50 %	Formyl Blue B
1,25 %	Formyl Violet 10B,
	or
4,50 %	Union Blue 761 J
0,35 %	Brilliant Milling Green B;

for Black:

6 %	Oxy Diamine Black JW or JWF
0,50 %	Formyl Violet 10B.

In some cases, especially for mode shades, it is advisable to first dye the wool and the silk in an acid bath to approximately the desired shade, and then the cotton in a fresh, cold bath as per instructions on page 41, without however adding any soda or ammonia. — In the case of pale shades it is easier to obtain a thorough uniformity of shade on wool and silk when working according to this method.

b) Multi-coloured Effects.

For dyeing the *wool and the silk a uniform shade,* leaving the cotton to be covered at will subsequently, the following dyestuffs give the best results:

For pale shades:

China Yellow B
Indian Yellow G, R, FF
Orange extra, R
Azo Orseille BB
Acid Magenta
Rosazeïne B
Cyanole extra, FF, AB, BN
Thiocarmine R
Tetra Cyanole V, SF, extra
Indigo Blue N, SGN
Acid Green extra conc.
Fast Acid Green BN
Cyanole Fast Green G
Acid Violet 6BS, 6BC

for medium and dark shades:

Tropaeoline 00, RNP
Orange EN
Croceïne AZ
Brilliant Croceïne (all brands)
Scarlet EC
Roccelline
Tetra Cyanole A
Brilliant Milling Green B
Brilliant Milling Blue B
Formyl Blue B
Formyl Violet S4B, 6B, 10B
Alkaline Violet C, CA
Water Blue B, R, RB
Wool Blue TB
Naphtylamine Black 4B, 6B
Neutral Wool Black B, G.

Dye with

10 % Glauber's salt and
10—15 % bisulphate of soda,
or
15—20 % Glauber's salt and
4—5 % sulphuric acid;

enter at 60° C. (140 deg. F.), raise in 1/2 hour to the boil, and boil for 1/2 hour.

According to the shade by that time attained by the wool and the silk, the bath is either boiled up again or the goods are allowed to run in the cooling bath.

If the wool and silk are to be of a uniform shade, prolonged boiling should be avoided, because the colour would otherwise be stripped off the silk and absorbed by the wool. If the cotton is to remain as white as possible, this is best attained by adding a little more acid to the bath and allowing the goods to run at about 85—90° C. (185—195 deg. F.).

Dyeing at 90° C. (195 deg. F.) and subsequently adding some more acid is also preferable to boiling if the wool is to be dyed deeper still.

The cotton is dyed subsequently both in the case of solid shades and of shot effects, as indicated on page 41, without however adding ammonia or soda.

2. For *previously dyeing black, blue or red shades on cotton,* in the case of goods the wool and silk part of which is to be cross-dyed, dyestuffs should be selected which withstand acid dyeing; for instance:

Diamine Black BH, BHN
Diamine Azo Black B
} diazotised and developed with Beta Naphtol or Beta Naphtol and Phenylene Diamine

Diaminogene Blue NB, NA	diazotised and developed with Beta Naphtol.
Diamine Azo Blue 2R	
Diamine Azo Scarlet A, B	

Dye at 50—60° C. (120—140 deg. F.) with the addition of 3—$4^{1}/_{2}$ oz soap per 10 gallons liquor only, in order to leave the wool and the silk as white as possible; or, if a slight staining of these fibres is not objectionable in the subsequent manipulations, with 1 lb Glauber's salt per 10 gallons liquor.

After a light rinsing, the cotton colour is diazotised and developed, and the wool and silk is then dyed with the colours suitable for this purpose.

3. *Dyeing the wool first* and leaving the silk and cotton unstained.

Suitable dyestuffs are the following:

For compound shades (Grey, Mode, Brown, Olive etc.):

Acid Yellow AT
Naphtol Yellow S
Orange GG
Lanafuchsine SG, SB
Cyanole FF, extra
Azo Wool Blue C;

for Pink, Red and Claret:

Eosine 3G, GGF, BN
Eosine Scarlet B
Brilliant Scarlet 4R, 6R
Crystal Scarlet 6R
Brilliant Cochineal 2R
Scarlet FR, F2R, F3R
Lanafuchsine 6B
Naphtol Red C
Amaranth
Azo Wool Violet 7R;

for Navy and Dark Blue:

Combinations of

Lanafuchsine 6B
Azo Wool Violet 7R
Orange GG
Acid Yellow AT,

for Green:

Acid Green extra conc., 5G
Naphtol Green B
shaded if necessary with
Azo Wool Blue C
Acid Yellow AT
Orange GG;

for Black:

Naphtylamine Black EFF.

Colours, with the exception of the pinks and reds produced with Eosine and Eosine Scarlet, are dyed with

10 % cryst. Glauber's salt

and, according to the depth of shade required,

8—15 % acetic acid

or

10 % cryst. Glauber's salt
$1^1/_2$—$2^1/_2$ % formic acid of 85 %

and the requisite quantity of dyestuff. Enter the goods straight into the boiling bath, boil severely for about 1 hour, rinse well, and sour off with an addition of acetic acid or formic acid to the last rinsing bath.

For *Eosine* and *Eosine Scarlet*, charge the dyebath with

10 % cryst. Glauber's salt,
2—5 % acetic acid of 30 %

and the dyestuff. Enter the goods at 50–60° C. (120–140 deg. F.), raise within $^1/_2$ hour to boiling point, boil for 30 to 40 minutes, rinse, and brighten in an acid bath.

For *black*, charge the bath with

10 % cryst. Glauber's salt,
2 % formic acid

and the requisite dyestuff; enter the goods at boiling temperature, add after $^3/_4$ hour's boiling

2 % formic acid of 85 %

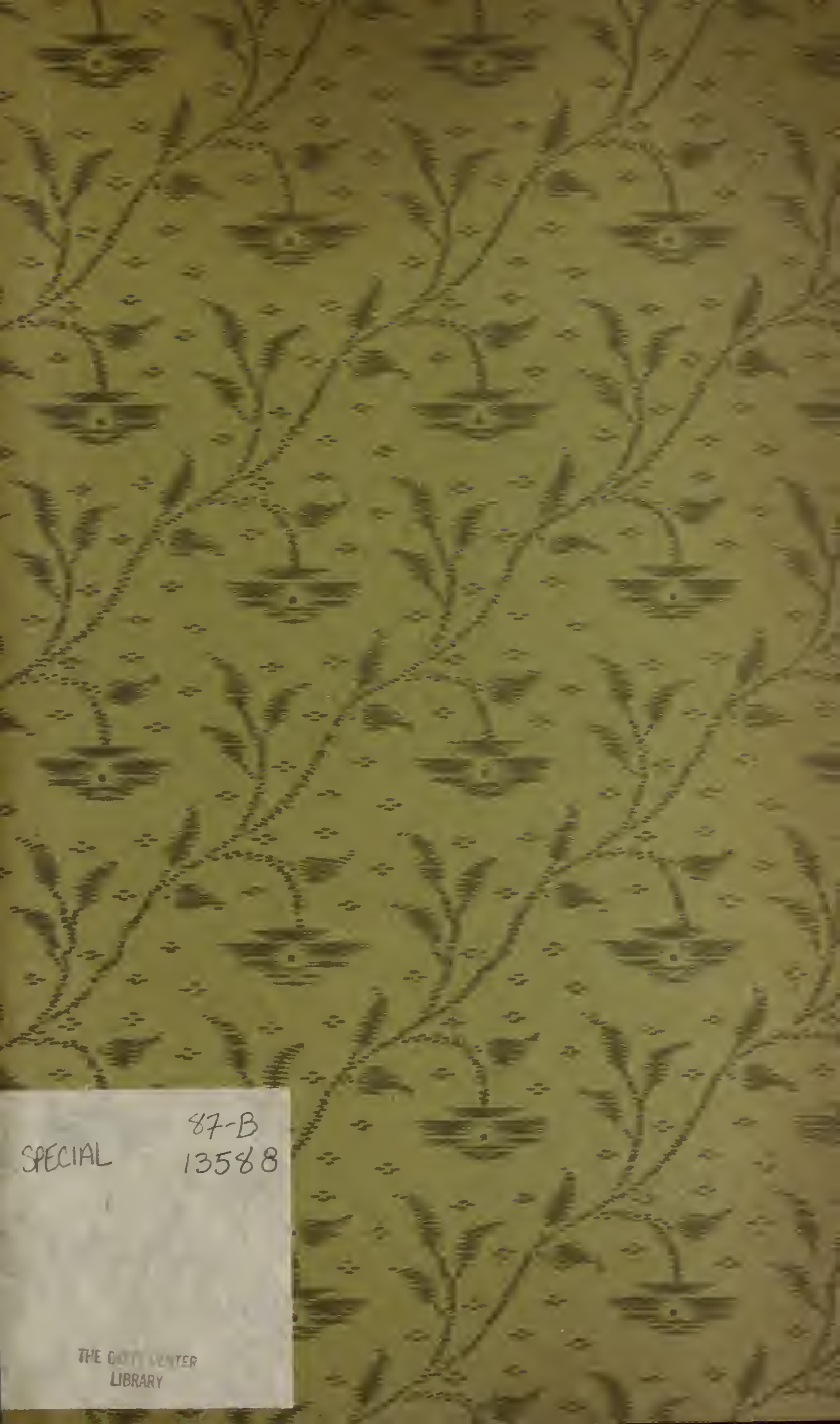
in several portions, and run for another 20 to 30 minutes in the strongly boiling bath.

The silk is then stripped if necessary with hydrosulphite and dyed to the desired shade in a lukewarm bath acidulated with acetic acid.

The following dyestuffs go well on to the silk in a lukewarm bath:

Milling Yellow 0
Indian Yellow G
Tropaeoline RNP
Orange ENZ, R
Croceïne AZ
Brilliant Croceïne M
Milling Red FR
Amaranth
Azo Orseille BB
Lanafuchsine 6B
Rosazeïne B
Acid Green extra conc.
Brilliant Milling Green B
Tetra Cyanole V
Cyanole FF
Indigo Blue N, SGN
Formyl Blue B
Brilliant Milling Blue B
Formyl Violet 10B, S4B
Acid Violet 6BS
Water Blue B
Wool Blue TB
Naphtol Blue G, R
Naphtol Blue Black.

The cotton is then covered with Diamine Colours in a cold bath as described on page 41, no ammonia or soda being however added.



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